# SUGARCANE RESEARCH

## Annual Progress Report

1986

LOUISIANA
AGRICULTURAL
EXPERIMENT STATION
LOUISIANA STATE UNIVERSITY AGRICULTURAL CENTER

# SUGARCANE RESEARCH

## ANNUAL PROGRESS REPORT

1986

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LOUISIANA AGRICULTURAL EXPERIMENT STATION
DR. C. ORAN LITTLE, VICE CHANCELLOR AND DIRECTOR

LOUISIANA STATE UNIVERSITY AGRICULTURAL CENTER
DR. H. ROUSE CAFFEY, CHANCELLOR

# FOREWORD

Research on sugarcane in the Louisiana Agricultural Experiment Station is an integral part of the LSU Agricultural Center's research-extension effort to provide the base knowledge and technology for efficient production and processing of sugarcane. Funds are expended through discipline oriented departments and regionally oriented branch stations.

Scientists working on sugarcane are housed in six departments[1/] : Agricultural Economics and Agribusiness, Agricultural Engineering, Agronomy, Entomology, Plant Pathology and Crop Physiology, and the Sugar Station. Most faculty members of the Louisiana Agricultural Experiment Station hold joint appointments with the College of Agriculture, teach at the undergraduate and/or graduate level, and are involved in graduate student training.

Members of the Louisiana Agricultural Experiment Station maintain close working relations with colleagues employed by the Louisiana Cooperative Extension Service, the Agricultural Research Service and Soil Conservation Service of the USDA, American Sugar Cane League, Louisiana Department of Agriculture, Audubon Sugar Institute[1/] and other budgetary units of the Baton Rouge Campus.

A major portion of the St. Gabriel Research Station's resources is devoted to sugarcane research. The participation of the Burden Research Plantation, Citrus Research Station, and the Iberia Research Station in helping to accomplish specific sugarcane research objectives in 1986 is acknowledged.

An important part of the 1986 research activities was conducted on cooperating farms throughout the sugarcane industry. The dwindling of farm labor supply has been making the evaluation of location effects increasingly difficult. However, these evaluations are very important and must be continued. The cooperation of the membership of the American Sugar Cane League in accomplishing this research is gratefully acknowledged.

Finally, it must be pointed out that the information in this report is from 1986 only and should be regarded as preliminary. Completed research is reported in appropriate Experiment Station and Extension Service publications and/or other professional publications.

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1/ Audubon Sugar Institute was transfered from the Baton Rouge Campus to the Agricultural Center during the 1986-87 fiscal year.

TABLE OF CONTENTS

Foreward . . . . . i

Table of Contents . . . . . ii

Sugarcane Field Day Report - 1986 . . . . . 1

Field Evaluation of Sugarcane Planters . . . . . 2

Evaluation of Some Properties of Sugarcane . . . . . 6

Water Management for Sugarcane Production . . . . . 7

The Department of Agricultural Economics and Agribusiness 1986 Sugarcane Research Report . . . . . 11

Sugarcane Smut and Pythium Root Rot Research . . . . . 13

Ratoon Stunting Disease of Sugarcane . . . . . 15

Cultural Practices and Soil Fertility for Sugarcane . . . . . 18

Winter Cover Crops for Fallow Year Planting . . . . . 38

Sugarcane Insects Ecology and Pest Management . . . . . 41

Sweet Sorghum for Biomass and Sugar Production in Louisiana . . . . . 44

A Comparison of Two Methods of Estimating Yield in Sugarcane . . . . . 51

Estimating the Ratooning Ability of Sugarcane Varieties . . . . . 52

A Study of the Heritability of Flowering in Sugarcane . . . . . 53

The Response of Saccharum Species to Growth Regulators Used as Tillering Agents . . . . . 54

Sucrose Lab Activities - 1986 Harvest Season . . . . . 55

Photoperiod and Crossing for the Year 1986 . . . . . 56

Selections, Line Trials, and Assignments for the Year 1986 . . . . . 66

Results From the 1986 Infield Variety Trials at St. Gabriel . . . . . 70

Varietal Evaluation at the Iberia Research Station . . . . . 83

Results from the Outfield Variety Trials Harvested in 1986 . . . . . 85

Weed Control Report . . . . . 99

1986 Publications and Presentations . . . . . .108

# Sugarcane Field Day Report - 1986

Charles G. Richardson
St. Gabriel Research Station

The St. Gabriel Research Station was established in 1968 as a part of the Louisiana Agricultural Experiment Station. The station is located on the east side of the Mississippi River in Iberville Parish on 1,564 acres of land acquired from the Louisiana Department of Corrections.

Since the station is located approximately nine miles from the LSU campus, the research is conducted by staff members from various departments on the campus. Each of these staff members also has teaching responsibilities in their respective departments on the Baton Rouge campus.

Sugarcane is one area of major emphasis on the station. Approximately 225 acres are assigned for sugarcane research and variety improvement.

The LSU Area Sugarcane Field Day was organized in 1983 with the first field day held in July of that year. The field day is a joint effort of the Louisiana Agricultural Experiment Station and the Louisiana Cooperative Extension Service Personnel.

The Fourth Annual LSU Area Sugarcane Field Day was held July 16, 1986. The American Sugar Cane League 1986 Contact Committee Meeting was held in conjunction with this field day.

Following the field tour and discussion of research plots on the station, the group assembled at the St. Gabriel American Legion Hall. At this time Dr. C. Oran Little, Vice Chancellor for Research and Director of Louisiana Agricultural Experiment Station, addressed the group. The high yield awards for the participating parishes were then presented, followed by lunch, which was prepared and served by the host, Iberville Parish.

# FIELD EVALUATION OF SUGARCANE PLANTERS

R. L. Parish and P. P. Chaney
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Louisiana Cooperative Extension Service

## Field Procedure:

Eight mechanical sugarcane planters and 3 planting aids were evaluated on the basis of uniformity of planting and damage to the cane stalks. Four automatic feed control systems were included in the tests. The tests were conducted on farms using farmer-owned machines operating under normal field conditions.

Uniformity was measured in two ways: coefficient of variation of number of stalks per row measured at points 10 feet apart for a 200-foot length of row, and number of skips and piles per 1000 feet of row. Each was replicated on three rows. Planter damage was determined by first checking the degree of damage in 100 stalks pulled from the planter before planting and then comparing this with damage to stalks from 35 feet of row after planting. This test was replicated on three rows also. The difference between damage after planting and damage existing before planting was assumed to be planter damage. Planting rate was also determined from this data.

Cooperation and assistance from Cooperative Extension Service Personnel, the American Sugarcane League, and individual farmers was essential to the success of this test and is gratefully acknowledged.

## Results:

Results of the study are summarized in Tables 1-5 on the following pages. There was no difference in uniformity between automatic and manual feed systems. As expected, hand planting was more uniform than mechanical planting. Planting rates varied from 2.6 to 12.8 tons per acre. The number of good eyes planted varied from 28,000 to 111,00 per acre. Hand planting caused less damage than mechanical planting. In a direct comparison between manual and automatic feed control on the same planter, there was no difference in damage. The open-drum finger planter had the least damage of all mechanical planters.

Table 1. Uniformity of planting with all systems.

| Planter | Mean # of stalks | Coef. of Var., % | Skips per 1000 ft. | Piles per 1000 ft. |
|---|---|---|---|---|
| Hand Planters | | | | |
| Standard | 3.97bc[1] | 33c | 0.3c | 7.0de |
| Standard | 4.41bc | 28c | 0.6c | 7.0de |
| Kleentek | 2.54ef | 35c | 0.0c | 0.6e |
| Mechanical, manual | | | | |
| Drum, notches | 2.26f | 74a | 19.7a | 16.3bcde |
| Open drum, fingers | 4.32bc | 72a | 12.5ab | 26.7abcd |
| Modified Julian | 5.56a | 44bc | 8.4bc | 41.4a |
| 2-row drum, left | 4.73b | 70a | 16.2ab | 29.2abc |
| right | 5.92a | 82a | 19.1a | 30.1abc |
| Mechanical, automatic feed | | | | |
| Drum, hydraulic, LSU | 3.13de | 76a | 16.5ab | 6.0de |
| Drum, hydraulic, 2-stage | 3.84cd | 69a | 17.1ab | 36.5ab |
| Slat, mechanical link | 4.21bc | 61ab | 15.2ab | 18.0bcde |
| Drum, Cameco | 3.03def | 81a | 13.0ab | 12.3cde |

[1]Entries followed by the same letter are not significantly different at the 5% level, based on Duncan's multiple-range test.

Table 2. Measured rate of planting for all systems.

| Planter | Lbs. per stalk | Lbs. per acre | Tons per acre | Eyes per stalk | Eyes per acre |
|---|---|---|---|---|---|
| Hand Planters | | | | | |
| Standard | 2.37 | 14,393bcd[1] | 7.2bcd | 7.69 | 45,071bcd |
| Standard | 2.16 | 18,175abc | 9.1abc | 8.98 | 66,070abc |
| Kleentek | 1.89 | 7,187de | 3.6de | 9.78 | 31,944d |
| Mechanical, manual | | | | | |
| Drum, notches | 2.37 | 13,352bcde | 6.7bcde | 7.69 | 33,730cd |
| Open drum, fingers | 2.32 | 12,901bcde | 6.5bcde | 8.24 | 45,656bcd |
| Modified Julian | 1.62 | 25,603a | 12.8a | 8.63 | 110,921 |
| 2-row drum, left | 1.62 | 13,631bcde | 6.8bcde | 8.63 | 59,412abcd |
| right | 1.62 | 18,728ab | 9.4ab | 8.63 | 80,557a |
| Mechanical, automatic feed | | | | | |
| Drum, hydraulic, LSU | 2.37 | 9,711cde | 4.9cde | 7.69 | 31,242d |
| Drum, hydraulic,2-stage | 1.95 | 16,122bc | 8.1bc | 9.14 | 66,509ab |
| Slat, mechanical link | 2.41 | 10,627bcde | 5.3bcde | 11.78 | 50,281abcd |
| Drum, Cameco | 1.91 | 5,171e | 2.6e | 10.23 | 28,096d |

[1]Entries followed by the same letter are not significantly different at the 5% level, based on Duncan's multiple-range test.

Table 3. Quality of cane before planting

| Planter | Total eyes per stalk | Split nodes, % of total | Crushed or penetrated, internodes, % | Damaged eyes, % of total |
|---|---|---|---|---|
| Hand Planters | | | | |
| Standard | 7.69 | 2.3 | 7.2 | 5.5 |
| Standard | 8.98 | 3.2 | 7.0 | 3.7 |
| Kleentek | 9.78 | 1.2 | 13.6 | 14.0 |
| Mechanical, manual | | | | |
| Drum, notches | 7.69 | 2.3 | 7.2 | 5.5 |
| Open drum, fingers | 8.24 | 2.1 | 3.6 | 0.4 |
| Modified Julian | 8.63 | 7.1 | 6.3 | 2.8 |
| 2-row drum, left | 8.63 | 7.1 | 6.3 | 2.8 |
| right | 8.63 | 7.1 | 6.3 | 2.8 |
| Mechanical, automatic feed | | | | |
| Drum, hydraulic, LSU | 7.69 | 2.3 | 7.2 | 5.5 |
| Drum, hydraulic, 2-stage | 9.14 | 1.9 | 3.8 | 2.7 |
| Slat, mechanical link | 11.78 | 2.5 | 3.8 | 9.3 |
| Drum, Cameco | 10.23 | 1.5 | 3.8 | 4.9 |

Table 4. Quality of cane after planting.

| Planter all figures in % | Split nodes | | Damaged internodes | | Damaged eyes | |
|---|---|---|---|---|---|---|
| | total damage | planter damage | total damage | planter damage | total damage | planter damage |
| Hand Planters | | | | | | |
| Standard | 1.9cde[1] | 0.4c | 6.5de | 0.1e | 3.7cd | 0.0c |
| Standard | 6.0bcd | 2.8abc | 5.0e | 0.0e | 5.2cd | 1.5c |
| Kleentek | 0.2e | 0.0c | 16.9ab | 3.6de | 16.8ab | 2.8c |
| Mechanical, manual | | | | | | |
| Drum, notches | 6.8abc | 4.5abc | 19.3a | 12.1ab | 17.4ab | 11.9a |
| Open drum, fingers | 1.1de | 0.0c | 5.1e | 1.5e | 0.8d | 0.4c |
| Modified Julian | 8.2ab | 1.2bc | 8.2cde | 1.9e | 7.4c | 5.0bc |
| 2-row drum, left | 10.4ab | 3.8abc | 10.3cde | 4.0de | 7.5c | 4.7bc |
| right | 12.0a | 4.9abc | 12.3bc | 5.9cd | 7.5c | 4.7bc |
| Mechanical, automatic | | | | | | |
| Drum, hydraulic, LSU | 8.9ab | 6.6a | 17.1ab | 10.0abc | 17.3ab | 11.8a |
| Drum, hydraulic, 2-stage | 9.5ab | 7.6a | 11.2cd | 7.4bcd | 13.9b | 11.2a |
| Slat, mechanical link | 5.4bcde | 2.9abc | 11.3cd | 7.5bcd | 19.8a | 10.5ab |
| Drum, Cameco | 7.6ab | 6.1ab | 18.1a | 14.3a | 17.5ab | 12.6a |

[1]Entries followed by the same letter are not significantly different at the 5% level, based on Duncan's multiple-range test.

Table 5. Comparison of good and bad eyes planted per acre.

| Planter | Total eyes planted per A | Bad eyes planted per A | Good eyes planted per A |
|---|---|---|---|
| Hand Planters | | | |
| Standard | 44,998bcd[1] | 1,683cd | 43,388bcd |
| Standard | 66,070abc | 3,439cd | 62,631ab |
| Kleentek | 31,944d | 5,324abcd | 26,620cd |
| Mechanical, manual | | | |
| Drum, notches | 33,730cd | 6,000abc | 27,730cd |
| Open drum, fingers | 45,656bcd | 366d | 45,290bcd |
| Modified Julian | 110,921 | 8,926ab | 101,995 |
| 2-row drum, left | 59,412abcd | 4,171bcd | 55,241abc |
| right | 80,557a | 6,073abc | 74,484a |
| Mechanical, automatic feed | | | |
| Drum, hydraulic, LSU | 31,242d | 5,488abc | 25,755cd |
| Drum, hydraulic, 2-stage | 66,509ab | 9,439a | 57,070ab |
| Slat, mechanical link | 50,281abcd | 9,814a | 40,466bcd |
| Drum, Cameco | 28,096d | 4,975abcd | 23,120d |

[1]Entries followed by the same letter are not significantly different at the 5% level, based on Duncan's multiple-range test.

Publications:

Parish, R. L., P. P. Chaney, and F. E. Sistler. 1986. Evaluation of a modified air carrier sprayer in sugarcane. Transactions of the ASAE 29(1):34-36.

Chaney, P. P., R. L. Parish, and F. E. Sistler. 1986. An automatic control system for a sugarcane planter. Applied Engineering in Agriculture 2(2):51-54.

Sverzut, C. B. and R. L. Parish. 1986. Electrical control for hydraulic cylinders on harvesters. Journal of ASSCT (abstract) 6:139.

Parish, R. L., P. P. Chaney, and F. E. Baker. 1987. Field evaluation of sugarcane planters. American Society of Agricultural Engineers paper number 87-1020.

# EVALUATION OF SOME PROPERTIES OF SUGARCANE

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Agricultural Engineering Department

Objectives:

1. To evaluate some properties of sugarcane using four forms of radiation.
2. To determine the correlation between the physical properties and the quality of sugarcane.

Summary:

A study was undertaken to evaluate new methods for rapid estimation of sugar, fiber, and moisture contents as well as the biomass of sugarcane. The NIR method can analyze the samples for sugar, moisture, fiber, and Pol values in less than one minute. The microwave method can reduce the time necessary to perform sugar and moisture analysis using the press method from 48 hours to a few minutes. Gamma ray transmission can be used to estimate crop yield in the field, and NMR can be used to measure the moisture content of whole stalks of sugarcane if its accuracy is improved. Considerable time can be saved if one of these methods is used to analyze sugarcane samples for quality.

Near Infrared (NIR) spectroscopy was applied to estimate Pol as a percent of juice, and fiber, sugar, and moisture content as a percent of cane from shredded sugarcane samples. The results from this analysis were not statistically different ($p > 0.05$) from the standard press method commonly used. The determination coefficient values of the regression lines for the calculated values using NIR on the measured values were 0.94 for fiber, 0.98 for Pol, 0.98 for moisture, and 0.99 for sugar.

A household microwave oven was used to rapidly evaluate the moisture content of shredded sugarcane samples. There was no significant difference between the microwave, heated air oven, and the standard press methods ($p > 0.05$). The determination coefficient of the regression line of the calculated sugar content using the standard and the microwave oven values was 0.99.

Gamma ray transmission was used to evaluate the linear attenuation coefficient of sugarcane stalks. The total mass attenuation coefficient was calculated from the linear attenuation coefficient. The mass for the scan section as well as for a portion of a stalk was calculated and there was no significant difference between the calculated values and the measured values ($p > 0.05$). The determination coefficients of the regression lines of the measured values using gamma ray and the observed values for mass values were 0.89 for scan section, and 0.86 for portion of the stalk.

NMR was used to evaluate moisture content of whole stalks of sugarcane. Two amplitudes were taken from the Free Induction Decay curve. The amplitude ratio was correlated to the moisture content in the sample. The value of the correlation coefficient obtained was 0.82. It was also found that the magnet inhomogeneity needs to be controlled in order to obtain more accurate results.

# WATER MANAGEMENT FOR SUGARCANE PRODUCTION

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USDA-Agricultural Engineering Department

## Subsurface Drainage:

Weather conditions were favorable for sugarcane production in south Louisiana during 1986. Rainfall during the spring months was below normal which was good for sugarcane since the low rainfall resulted in the water table remaining two feet or more below the soil surface most of the time. During years with normal and above normal rainfall, the water table rises to near the soil surface and remains there for prolonged periods during the late winter and spring months.

At two subsurface drained field sites (Patout and Sterling farms), cane yields from the nondrained areas were about the same as those from the subsurface drained areas. Rainfall amounts, water table measurements, and crop yields indicated that the water table was not a serious problem in 1986. Cane and sugar yields for these sites are as follows:

| | Patout | | Sterling | |
|---|---|---|---|---|
| | Cane (T/A) | Sugar (lbs/A) | Cane (T/A) | Sugar (lbs/A) |
| Drained | 29.1 | 5104 | 40.4 | 6787 |
| Nondrained | 29.3 | 5127 | 39.5 | 6692 |

At the Patout site, cane and sugar yields were determined from wagon loads of cane weighed at the mill and juice quality determined from core samples analyzed in the mill's lab. At the Sterling site, cane yields were determined from wagon loads of cane weighed at the mill and from juice quality determined at the USDA Sugar Cane Laboratory from stalks of cane taken from the fields. The cane at the Sterling site was not burned before weighing, thus, cane weights were adjusted for trash before calculating sugar yield. Mill juice quality data were not used because good core samples could not be obtained due to the trashy, nonburned cane.

## Water Management:

Water management includes subsurface drainage, subirrigation, and water table control. The water management system for sugarcane at the Westfield farm in Assumption Parish automatically drains water from the soil profile during wet rainy conditions and adds water via the subsurface drain tubes during droughts. Furthermore, the water table is controlled so that it can be raised or lowered quickly to drain or irrigate as needed. The 1986 crop was the third at this site since the system was installed. Although good weather

conditions (low rainfall amounts in the late winter and spring) were favorable for cane growth in 1986, considerable differences in yields between the water managed and the nondrained areas were measured. There are two possible reasons for this. One is that adverse conditions in the nondrained area during the previous crops continued to have an adverse effect in second ratoon. The other is that subirrigation during the summer months gave the cane in the water managed fields a boost that resulted in higher yields. The cane and sugar yields from this experiment are as follows:

| | Cane Yield (T/A) | Sugar Yield (lbs/A) |
|---|---|---|
| Subsurface Water Managed | 29.5 | 4953 |
| Nondrained | 24.9 | 3777 |

Cane and sugar yields were determined from wagon loads of cane weighed at the mill and from juice quality of core samples determined in the mill's lab.

Cane and sugar yields from water managed areas in 1986 were 18 and 31 percent more, respectively, than those from the nondrained areas. This was the third consecutive year that yields from either subsurface drained areas (in 1984) or water managed areas (1985 and 1986) were increased above those from nondrained areas at Westfield. Cane and sugar yields from all three years are shown in Table 1.

Cane yields were similar in 1985 and 1986, but the 1986 sugar yields were lower than those in 1985. This is attributed to height of the cane. In 1986, the cane's height was shorter, thus when the crop was harvested more green tops were left on the stalks which resulted in high tonnage per acre but low sugar per ton. Consequently, sugar per acre was less in 1986 than in 1985.

Subsurface drainage costs:

One of the most frequently asked questions about subsurface drainage is "how much does it cost?" There is no clear cut answer to this because cost per acre is based primarily on drain spacing. Drain spacing varies with soil type and with the crop grown. For sugarcane on clay soil, drains should be spaced about 30 to 35 feet apart. For sugarcane on silt loam soil, drains should be spaced from 90 to 120 feet apart. Before a decision is made on drain spacing, a soil survey by SCS is recommended to determine the soil type. Knowing the soil type, an estimate can then be made of the soil's porosity and its hydraulic conductivity (the rate at which water flows through soil). Drain spacing can be calculated if these two variables are known.

The cost per foot to install subsurface drains varies with competition among those who install drains. When a large number of contractors compete for drain installation business, like that which occurs in the Midwestern

states, the cost per foot may be as low as 30 cents. If little or no competition exists, the price may be $1.00 per foot. In Louisiana, there are no subsurface drainage contractors, thus, machinery must be moved to Louisiana from outside the state. Thus, a contractor must charge enough to pay for moving his equipment to Louisiana in addition to his normal operating costs. Competition is very keen in Michigan at the present time. There is a contractor in Michigan who is interested in working in Louisiana. He estimated his charge per foot at 60 cents. If enough work were available to keep him in Louisiana for a couple of months or more, his charge per foot would be 50 cents. This price includes opening the trench to depths up to 4.5 feet, installing a 4-inch plastic drain tube, and backfilling the trench. Larger diameter drains and drains with a filter wrap (needed in silt and fine sandy soils) would cost more. Using these quoted per-foot charges, the costs per acre for different drain spacings were calculated and are shown in Table 2.

For soil types such as Commerce silt loam and Jeanerette silty clay loam, drain spacing should be from 90 to 120 feet. If 100 foot spacing were used, 435 feet of drain tubing per acre would be required (Table 2). The drain tubing and the installation of it would cost $217 per acre (Table 2). Since most of the drainage ditches in Louisiana are not suitable for subsurface drain outlets because they fill with water during rains, a sump equipped with pumps is recommended as an outlet for the subsurface drains. The cost of a sump varies depending upon whether it is made in the farm shop with scrap metal or whether it is purchased from a fabricator. A 4x4x10-foot metal sump equipped with two 1/2 hp sump pumps will serve from 10 to 20 acres. If this sump and two pumps could be obtained for $1,000.00, then the cost per acre is $100 assuming that the sump would serve 10 acres. Adding together the cost for installing the drains and the cost of the sump, the total estimated cost for the drainage system is $317.00 per acre. The system should last 20 years or more. Plastic tubing will not deteriorate but the sump, if made of metal, may rust and of course the pumps will have to be replaced occasionally. Drain line clogging with sediment or with iron ochre could adversely affect the longevity of a subsurface drainage system in Louisiana. If we assume that the system would last only 15 years, a conservative number, then the cost per acre per year for the drainage system is only $21 ($317 per acre/15 years). If the soil were clay, drain spacing would be 30 feet and cost $971 per acre ($871 for the tubing and $100 for the sump). Cost per acre per year for clay soil would be $65, assuming a 15 year life for the subsurface drainage system. These costs do not include interest nor do they include tax breaks for land improvement.

Annual sugar yield increases exceeding 500 lbs/A have been attributed to subsurface drainage. Furthermore, field data have suggested that subsurface drainage can increase the number of stubble crops harvested from the normal two to three, thus providing an additional economic benefit. There are additional benefits to subsurface drainage that are known to exist but for which we have no data to show. For example, in a subsurface drained field, timeliness of operations is enhanced since a farmer can enter the field for cultivating much sooner after a rain than if the field were not subsurface drained.

Although the initial outlay for subsurface drainage is relatively high, the cost per acre per year is very reasonable for silt loam and silty clay loam soils. Subsurface drainage is a practice that should be included in sugarcane production in Louisiana.

Table 1. Cane and sugar yields from water managed and nondrained areas at the Westfield farm in Assumption Parish, Louisiana 1984-1986.

| Field Condition | Cane Yield (T/A) | | | Sugar Yield (T/A) | | |
|---|---|---|---|---|---|---|
| | 1984 | 1985 | 1986 | 1984 | 1985 | 1986 |
| Subsurface Water Management | 40.9 | 29.8 | 29.5 | 7226 | 6543 | 4953 |
| Nondrained | 38.5 | 23.6 | 24.9 | 6449 | 5074 | 3777 |

Table 2. Estimated cost per acre for installing subsurface drainage in Louisiana in 1987.

| Drain spacing (feet) | Drain tubing needed per A. (feet) | Cost per acre at $0.50 per foot ($/A) | Cost per acre at $0.60 per foot ($/A) |
|---|---|---|---|
| 120 | 363 | 181 | 217 |
| 100 | 435 | 217 | 261 |
| 90 | 484 | 242 | 290 |
| 75 | 580 | 290 | 348 |
| 60 | 726 | 363 | 435 |
| 45 | 968 | 484 | 580 |
| 30 | 1452 | 726 | 871 |

The Department of Agricultural Economics and Agribusiness
1986 Sugarcane Research Report

Brian A. Chapman
Department of Agricultural Economics and Agribusiness

Annual Costs and Returns Projections:

The department continued to publish its annual estimates of the costs and returns from sugarcane production in South Louisiana. These results were published and released in January 1987. For the first year since the new format was adopted in 1982, the report covers only three-row sugarcane farms. One-row farms have been omitted.

The net returns per acre of land in sugarcane were estimated to be $174.24 for sandy soils, and $143.08 for clay soils in the River region; and $162.97 for sandy soils, and $129.03 for clay soils in the Bayou Teche region. These values represent returns after covering all variable and fixed costs, as well as a farm overhead charge per acre, (Table 1).

Table 1. A Summary of Projected Costs and Returns Per Acre of Land in Sugarcane, Tenant Grower, South Louisiana, 1987. [a/]

| Production Area, Soil Type | Adjusted per Acre Yield [b] | Total Income [c] [d] | Total Variable Costs | Total Fixed Costs | Overhead Costs | Residual Returns |
|---|---|---|---|---|---|---|
| | lbs. | - - - - - - - - - - | | dollar | - - - - - - - - - - | |
| River Region | | | | | | |
| Sandy Soils | 1663 | 411.55 | 126.53 | 66.66 | 41.12 | 174.24 |
| Clay Soils | 1537 | 380.47 | 127.39 | 65.88 | 41.12 | 143.08 |
| Teche Region | | | | | | |
| Sandy Soils | 1663 | 411.55 | 138.00 | 66.46 | 41.12 | 162.97 |
| Clay Soils | 1537 | 380.48 | 141.66 | 65.67 | 41.12 | 129.03 |

[a/] Computations based on a standard four year rotation; with one acre of heat treated cane planted per 100 acres of cane harvested and; one acre of cane for harvest given up for each five acres planted.

[b/] Reflects net output to the grower per acre of land in sugarcane from 3/4 acre of cultivate and harvest after foregoing 5% of the yield for planting 1/4 acre and "in kind" payments for land rent and milling services of 51.2 percent (4867 x .70 = 3406 x .488 = 1663).

[c/] Molasses output is 2.9 gallons per hundredweight of raw sugar.

[d/] Prices for raw sugar was 21.75 cents per pound and 36.26 cents per gallon of molasses.

Economic Comparisons of Sugarcane Rotation Options:

Two rotational schemes, commonly used on Louisiana sugarcane farms, were evaluated to reveal which rotation provided the greater net return per acre for different yield expectations. The two rotations were "33:33:33" and "40:40:20". Under 33:33:33, one-forth of the farm is assumed to be in fallow, and one-forth in each of the three cane crops - plant cane, first stubble, and second stubble. Under 40:40:20, the fallow land, the plant cane crop, and the first stubble crop each occupy approximately twenty-eight percent of the farm, and the second stubble crop is kept to approximately fourteen percent of the farm land. In the analysis, yield expectations were allowed to vary, and the net returns under each rotation were calculated. The result was the construction of a graphic aid on which yield expectations could be plotted and the economicly superior rotational scheme could be determined.

Processing Cost Study:

In August of 1986, seventeen of the twenty-one raw sugar factories supplied the department with seven years of cost of operation data. This data covered grindings from the 1979 season through the 1985 season. This data has since been placed in a computer data base, and averages for each season have been computed to summarize the cost of operating these raw sugar factories. This data will be helpful in our research efforts in the department, and there are plans to publish the summaries in March or April of 1987.

# Sugarcane Smut and Pythium Root Rot Research

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## Smut Overwintering and Spread Studies:

Smut-infected stools in plant cane fields of CP 65-357 and CP 74-383 were mapped during 1985 and then monitored during 1986 to determine the effect of a mild winter on the overwintering and spread of smut. In first stubble, smut re-occurred in 55% of the CP 65-357 stools which were infected as plant cane and in 20% of the CP 74-383 stools. The re-occurrence rates in first stubble following the severe 1984-1985 winter were only 17% and 3% for CP 65-357 and CP 74-383, respectively. Following the mild winter, five newly infected stools developed in first stubble for each stool infected in plant cane of CP 65-357 and two new smutted stools developed for each infected plant cane stool of CP 74-383. In contrast, less than one new infection developed in first stubble for each infected plant cane stool for both varieties following the 1984-1985 winter. The change in overall smut incidence from plant cane to first stubble was a five-fold increase in the number of whips produced in CP 65-357 and a two-fold increase in whips produced in CP 74-383 first stubble during 1986, whereas smut levels decreased by 50% and 30% in first stubble of CP 65-357 and CP 74-383, respectively, following the previous severe winter. These experiments were conducted cooperatively with U.S. Sugarcane Research Unit scientists.

## Smut Resistance Studies:

Inoculation trials to evaluate variety candidate resistance levels to smut are conducted yearly as part of the LSU, USDA, ASCL cooperative sugarcane breeding program. During 1986, 66 advanced variety candidates were evaluated by LSU personnel in a replicated test and 42 L and LCP 1984 series and 84 L and LCP 1985 series variety candidates were evaluated in an unreplicated screen for smut susceptibility. Seven of 66 (11%) 1980-1983 series selections, 4 of 42 (9%) 1984 series and 17 of 84 (20%) 1985 series selections were determined to be highly susceptible to smut and were dropped from the breeding program. The remaining variety candidates will be evaluated in first stubble during 1987.

A quantitative inheritance study to determine the heritability of smut resistance in Louisiana sugarcane cultivars was initiated in 1985, and plant cane infection level data were obtained during 1986. The experiment employed 18 crosses, and all parents and 10 progeny of each cross were inoculated with smut and planted at the Citrus Branch Experiment Station. An analysis of the plant cane infection data indicates that resistance is a heritable trait (narrow sense heritability estimate = 0.55), so the careful selection of crosses will increase the proportion of smut resistant variety candidates in the breeding program.

Experiments were conducted to determine if bud morphological traits or shoot growth rates are associated with smut resistance in Louisiana sugarcane varieties. No correlations were detected between smut resistance and bud size, shape or type of germination; the presence or absence of a bud flange; or the rate of initial shoot elongation.

Studies on the Role of Pythium Root Rot in Stubble Decline:

Additional pathogenicity tests were conducted in the greenhouse during 1986, to confirm that Pythium arrhenomanes causes significant reductions in root system development and growth rates of current commercial sugarcane varieties. Pythium causes severe root rot when tests are conducted during the winter, whereas root rot is limited to the feeder roots in tests conducted during the late spring and summer.

To determine the effect of Pythium root rot in sugarcane field soils, pesticides were used to control all or portions of the soil microflora in field soil collected and placed in large containers in the greenhouse. Plants grown in soils treated with a fumigant, methyl bromide; a nematicide, aldicarb; and a fungicide specific for Pythium, metalaxyl, showed increases in initial and regrowth rates as compared to plants grown in raw field soil. In addition, metalaxyl completely controlled root rot in plants grown in sterile soil inoculated with Pythium. These experiments were conducted in cooperation with Dr. R. W. Schneider, Department of Plant Pathology and Crop Physiology.

In a field experiment, metalaxyl applied in April along with fertilizer increased first stubble sugar/acre yields by 31% in a moderate stubbling variety, CP 70-321 and by 52% in a poor stubbling variety, CP 70-330.

Disease/Weed Interactions Affecting Stubble Decline:

Plant cane yield data was collected from an experiment studying the single and combined effects of Pythium root rot, ratoon stunting disease (RSD) and three weed control regimes on stubble yields of CP 70-321 and the effects of root rot and RSD on CP 70-330. A single treatment of metalaxyl applied at the time of fertilizer application was used to reduce or control Pythium root rot.

Significant yield reductions resulted from RSD infection in both varieties and in the RSD-free plots of CP 70-321 with no weed control. Yields were increased in all RSD-infected plots treated with metalaxyl to control root rot and in metalaxyl treated RSD-free plots of CP 70-321 in which weeds were not controlled. The highest yields were obtained from plots of both varieties which were RSD-free and treated with metalaxyl, and the lowest yields occurred in RSD-infected plots in which root rot was not controlled. This experiment will be allowed to run for five years in an attempt to determine which are the major factors contributing to stubble decline.

# RATOON STUNTING DISEASE OF SUGARCANE

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Projected Research:

Two ongoing research projects were completed in 1986. Hatch 2196 "Detection of ratoon stunting disease and sugarcane mosaic virus in sugarcane" culminated in fulfilling the objective of developing a diagnostic assay for RSD. The discovery of the alkaline-induced metaxylem autofluorescence assay for RSD is the most significant research finding on this disease in many years and is the basis for future research. The Louisiana Agricultural Experiment Station is investigating the patentability of the assay. State 2194 "Evaluation of a sugarcane cross for inheritance of resistance to ratoon stunting disease" was discussed under "water flow rates and variety yield responses" in last years progress report.

Two new projects have been initiated. Hatch 2506 "Evaluation of sugarcane cultivar response to ratoon stunting disease and its application to sugarcane selection" has as its focus to compare 3 methods for their feasability in selecting RSD resistant clones in the breeding program. The 3 approaches are replicated single stool yield trials, bacterial population determinations, and infectivity titration experiments. The second project Hatch 2505 "Host-parasite interactions in ratoon stunting disease of sugarcane" focuses on understanding how RSD affects susceptible and resistant clones of sugarcane. The alkaline-induced metaxylem autofluorescence assay will be used to look at bacterial distribution up and down the stalk to see if increased frequency of fluorescing bundles correlates with susceptibility. The involvement of the plant hormone ethylene in increasing or decreasing disease-induced stress through its role in causing vascular gel plugging will be investigated. Finally the presence and role of wall degrading enzymes in the disease will be addressed.

Unprojected Research:

The discovery of high incidence of RSD (as determined by alkaline-induced metaxylem autofluorescence) in ASCL release plots of CP 76-331 from the western area (15% of stalks sampled) versus the eastern area (0% of stalks sampled) in 1984 was unexpected (Fig. 1). To confirm the asymmetric distribution of RSD and to address the level of disease after RSD spread by the harvester the same plots were sampled in the fall of 1985. Disease incidence was 3% in the east and 33% in the west in the first stubble (Fig. 1). It was concluded that on the average growers in the Teche planted one diseased stalk in every three of CP 76-331 (Damann, K. E. Jr. 1986. Phytopathology 76: 1079).

To be aware of the RSD levels in the selection program, the 20 stalk samples from the 22 varieties of the 1983 series from the U.S.D.A. which were planted at two primary stations in the fall of 1986 were determined. Both sets of samples, those going to LIL TEXAS and STERLING primary stations, showed significant RSD levels in two varieties, 83-137 and 83-631. The same 22 varieties from L.S.U. which went to the EVAN HALL primary station were not sampled. Instead the 5 stalk samples of the 1984 series which were increased at St. Gabriel were sampled. Of the 19 CP 84-700's, 84-726 and 84-737 had 1 of 5 stalks diseased. Of the 21 LCP 84-200's sampled, 84-205 and 84-222 had 1 of 5 stalks diseased. This sampling and assay now allows the monitoring of the RSD status of seed sources and could result in significant improvements in freedom from RSD in seed if appropriately managed.

RSD Diagnostic Pilot Program:

Through the efforts of the Farm Bureau, the Louisiana Cooperative Extension Service, Dr. Clayton Hollier and myself an RSD diagnostic service pilot program using alkaline-induced metaxylem autofluorescence was offered in 9 of 15 sugarcane growing parishes during August of 1986. Samples submitted from 184 fields were processed and the information on RSD status was returned to the growers within a week. In addition the information was collated to give an overview of the RSD status of the sugarcane belt. The average incidence of RSD across all samples and locations was 22.4 % of the 3607 stalks submitted or 808 diseased stalks. The 808 stalks came from 108 of the 184 fields sampled or 59% of the fields were diseased. The mean level of disease in a diseased field would then be approximately 38% of the standing stalks. Considering that most of these samples were from fields to be used as seed and that further data from this sampling indicated a 10% increase in disease incidence due to spread by the harvester, it is not unreasonable to conclude that 22.4% + 10% would mean that a third of the seed planted had RSD.

Conclusions:

The sampling and assay for RSD can allow monitoring of the RSD status of seed sources and could result in significant improvement in freedom from RSD if appropriately managed. Work is continuing to make this diagnostic service available to growers.

FIG. 1. ASCL SEED INCREASE STATIONS SAMPLED FOR RSD IN CP76-331

(NO. POSITIVE STALKS/NO. SAMPLED)

| MISSISSIPPI RIVER | PLANT | STUBBLE |
|---|---|---|
| NEW HOPE | 0/10 | 0/20 |
| EVAN HALL | 0/10 | 0/20 |
| GRAUGNARD FARMS | 0/10 | 0/20 |
| GLENDALE | 0/10 | 0/20 |

| BAYOU LaFOURCHE | PLANT | STUBBLE |
|---|---|---|
| LULA | 0/10 | 0/20 |
| WESTFIELD | 0/10 | 0/20 |
| GLENNWOOD | 0/10 | 0/20 |
| LITTLE TEXAS | 0/10 | 0/20 |
| CEDAR GROVE | 0/10 | 3/20 |
| THIBODEAUX BROS. | 0/10 | 0/20 |
| LEIGHTON | 0/10 | 2/20 |
| RACELAND (S. COAST) | 0/10 | 2/20 |
| GEORGIA (S. COAST) | 0/10 | 0/20 |
| McLEOD | 0/10 | 2/20 |

0/14 PLOTS - 0%; 4/14 PLOTS - 29%
0/140 STALKS - 0%; 9/280 STALKS - 3%
SAMPLED - AUG. 13, 1984,
SEPT. 16, 1985

| BAYOU TECHE | PLANT | STUBBLE |
|---|---|---|
| CALUMET FARMS | 1/10 | 4/20 |
| STERLING | 1/10 | 11/20 |
| STERLING | 3/10 | 14/20 |
| BREAUX BROS. | 1/10 | 6/20 |
| OAKLAWN | 0/10 | 2/20 |
| ALLAIN | 2/10 | 8/20 |
| LONGMAN-PARKS | 0/10 | 6/20 |
| GREAT SOUTHERN | 5/10 | 12/20 |
| RONALD HEBERT | 0/10 | 0/20 |
| ENTERPRISE | 1/10 | 11/20 |
| CAROLINE | 1/10 | 4/20 |
| TRIPLE V FARMS | 3/10 | 1/20 |

9/12 PLOTS - 75%; 11/12 PLOTS - 92%
18/120 STALKS - 15%; 79//240 STALKS - 33%
SAMPLED - SEPT. 5, 1984
SEPT. 13, 1985

# Cultural Practices and Soil Fertility for Sugarcane[1/]

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Research was continued in 1986 to determine the effects of cultural practices and fertilization on the yield of current varieties of sugarcane in Louisiana. Cultural practice experiments were conducted on methods and rates of planting, dates of planting, dates of harvest, cane stubble protection and stubble cane longevity. Soil fertility experiments were conducted on fertilizers and nematocide needs for succession cane, rates and methods of fertilizer application and rates of gypsum application. These experiments were conducted in cooperation with the St. Gabriel Research Station and growers in the cane area.

The research was designed to provide information in an effort to help cane growers to produce maximum economic yields and to increase profitability in sugarcane production. This annual progress report is presented to provide the latest available data on certain practices and not as a final recommendation for growers to use all of these practices. Recommendations are based on several years of research data.

The weather conditions during the growing season for sugarcane were close to normal in 1986. There were no apparent limitations in cane growth due to weather conditions and the yields were relatively high.

## Methods of Planting

One experiment was conducted with plant cane to determine the effects of widths of planting furrow and rates of planting on the yield of cane varieties CP 72-370 and CP 76-331. The furrow widths were 15 and 24 inches and the rates of planting were 2 and 4 stalks in continuous lines on a standard row spacing. A V-furrow was planted with each variety as a check plot. The yield data obtained in this test are reported in Table 1. The increases in yield over the check plot were significant from the 15-inch drill with a four-stalk rate and from the 24-inch drill with both planting rates using variety CP 72-370. The increases in cane yield were significant only with 24-inch drill with a four-stalk planting rate when using variety CP 76-331. The increases in cane yield from the four- over the two-stalk rate were significant from the 15-inch drill with CP 72-370 and from the 15- and 24-inch drills with CP 76-331.

Another experiment was continued in 1986 from a plant cane test in 1985 to determine the effects of widths of planting furrow and rates of planting on the yield of first stubble cane. The treatments were the same as in the plant cane test described above except cane varieties CP 65-357 and CP 72-370 were planted in this test. The first stubble data reported in Table 2 show that

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[1/]This research was supported in part by grant funds from the Potash and Phosphate Institute, U.S. Gypsum Co., Allied Corporation and by sugarcane growers.

the increases in cane yield over the check plot were significant from the 15-inch drill with a four-stalk rate of planting using variety CP 65-357. The increases in yield from the four- over the two-stalk rate were not significant with each variety and drill width tested.

Date of Planting

An experiment was initiated to determine the effects of planting dates on the plant cane yield of four current varieties of sugarcane. The dates tested were September 13, October 1 and November 11 and the varieties were CP 70-321, CP 72-370, CP 74-383 and CP 76-331. The varieties were planted on each date in 1985 and harvested as plant cane in December, 1986. The data obtained are reported in Table 3. Each variety tested, except CP 76-331 produced significantly more cane yield when planted in September than November. CP 76-331 produced more yield when planted in September than October. As an average of varieties, the yields were significantly higher from the planting in September than October and higher from the planting in October than November.

Another test was continued from plant cane in 1985 to determine the effects of planting dates on the first stubble yield of four cane varieties. The dates were September 13, October 8 and November 11 and the varieties were CP 65-357, CP 70-321, CP 72-370 and CP 74-383. The varieties were planted on each date in 1984 and harvested as plant cane in November, 1985 and as first stubble cane in October, 1986. The yield data obtained with first stubble are reported in Table 4. The increases in cane yield were significantly higher from the October planting than the other planting dates with each variety tested except CP 74-383. With CP 74-383, the increases were significantly higher only from the October over the September planting date. As an average of varieties, the yields were significantly higher from the October than the September and November planting dates.

Succession Cane

An experiment was continued with first stubble cane in 1986 from succession planted sugarcane to determine the effects of applying fertilizers and Furadan nematocide in the fall and spring on cane yield. The test was initiated with plant cane variety CP 70-321 in 1985 and continued as first stubble cane in 1986 on a Commerce silt loam soil located on the St. Gabriel Research Station. The treatments consisted of a fall application of 0-0-0 and 90-90-90 fertilizer at planting time in 1984 and a spring application of 120-0-80 and 240-0-160 fertilizers in 1985 and 1986. Furadan at a rate of 10 lbs./A was applied at planting time and in the spring of 1985 and 1986.

The data obtained from this experiment in 1986 are reported in Table 5. The application of the fall fertilizer treatment at planting time in 1984 did not increase the yield of the first stubble cane in 1986. Also, the differences in yield between the 120-0-80 and 240-0-160 treatments applied in the spring of 1986 were small. The increase in cane yield from the use of Furadan was significant only with 120-0-80 spring treatment without the fall fertilizer treatment. As with plant cane last year, the nematocide was more beneficial without the application of fertilizer at planting time.

The differences in stalk number and weight and in the cane juice quality due to the treatments were not significant. The soil analysis data indicated that the extractable K and organic matter in the soil were relatively low and the yield responses to applied fertilizers were less than normally obtained at this location.

An experiment was conducted with succession and fallow planted sugarcane to determine the effects of fertilizers, a nematocide and a fungicide on the yield of plant cane. The test was initiated with cane variety CP 70-321 on a Commerce silt loam soil located on the St. Gabriel Research Station in 1986. The treatments consisted of a fall application of 0-0-0 and 90-90-90 fertilizer with succession cane and a spring application of 120-0-80 and 240-0-160 fertilizers with fallow and succession planted cane. Furadan nematocide at 10 lbs./A was applied in the fall and spring and Ridomil fungicide at 1/2 pint/A was applied only in the spring. The fall applications were made at planting time in 1985 and the spring applications were made in April, 1986.

The data obtained in this experiment are reported in Table 6. The increases in cane and sugar yields from the application of the fall fertilizer were significant with each rate of spring applied fertilizer and each pesticide tested with succession planted cane. The differences in yield between the 120-0-80 and 240-0-160 treatments applied in the spring were small with and without the fall fertilizer treatment. The increases in yield from the use of Furadan were larger without the fall fertilizer in fallow and succession planted cane. The use of Ridomil did not increase cane yield. As an average, the succession cane produced less yield without the fall fertilizer, but more with the fall fertilizer than the fallow planted cane. Apparently, the application of fertilizer at planting time is important to maintain normal plant cane yields from succession planted cane.

The stalk number was significantly lower in most cases with succession without fall fertilizer than the fallow planted cane. The stalk weight and juice quality were not significantly affected by the treatments. The soil analysis data indicated that the extractable K and organic matter in the soil were relatively low and the yield response to fall applied fertilizer was apparently due to the N and K fertilizers.

Rate and Method of Fertilizer Application

An experiment was initiated in 1986 to test rates and methods of fertilizer application on the yield of plant cane with variety CP 70-321. The extractable soil P was relatively high at this location and the fertilizer treatments consisted of 80 and 160 pounds of nitrogen and 0, 80 and 160 pounds of potash per acre. Two methods of application were tested consisting of banding the fertilizer in the off-bar furrow and broadcasting the fertilizer on the soil surface. All the treatments were applied in April, 1986. The data obtained are reported in Table 7. The cane yields produced with all treatment combinations were significantly higher than the check plot. The yield increases from 80 and 160 lbs./A of N alone were significant, but the differences in yield between the two N rates were small. The yield increase from the 80-0-80 over 80-0-0 was significant with the band application method. Yield increase from the 160-0-160 over the 160-0-0 was significant with the broadcast method. The broadcast method produced less cane with the 80-0-80

and more cane with the 160-0-160 than the band method. The results indicate that the band method of fertilizer application should be used with lower rates of fertilizer.

Another test was continued in 1986 from plant cane in 1985 to test rates and methods of fertilizer application on the yield of first stubble cane with variety CP 74-383. The rates and methods tested were the same as described above in the plant cane test. The data obtained with first stubble cane are reported in Table 8. The cane yields produced with all fertilizer combinations and each method of application were significantly higher than the yield on the check plot. However, the differences in yield among fertilizer treatments and between methods were small.

Gypsum Tests

A test was continued with first stubble cane in 1986 to determine the effects of applied mined gypsum on soil properties and cane yield on a Sharkey clay soil at Judice Farms in New Iberia. The rates of gypsum tested were 0, 1, 2.5, 5 and 10 tons per acre with four replications of each rate. The treatments were broadcasted by hand and mixed into the topsoil with the use of a rototiller prior to planting variety CP 65-357 in the fall of 1984. Normal cultural and fertilization practices were following during the growing seasons and the plant cane crop was harvested in December, 1985 and the first stubble crop was harvested in November, 1986.

The yield data obtained with first stubble cane are reported in Table 9. The yield increases from each gypsum rate above the check plot were positive. The increase from the 5 T/A rate approached significant and the increase from the 10 T/A was significant over the check plot yield. The higher yields with the gypsum treatments were apparently due to the significant increase in average stalk weight and diameter. The juice quality was not affected by the treatments.

Another test was initiated with plant cane in 1986 to determine the effects of applied by-product gypsum on soil properties and cane yield on a Sharkey clay soil at Cinclare Plantation in West Baton Rouge Parish. The rates of by-product gypsum tested were 0, 1, 2, 5 and 10 tons per acre of fluorogypsum and 5 tons per acre of phosphogypsum. The gypsum was broadcasted with a fertilizer spreader and mixed into the topsoil with the use of a rototiller prior to planting cane variety CP 72-356 in the fall of 1985.

The plant cane yield data obtained in 1986 are reported in Table 10. The yield increases from each gypsum rate above the check plot were positive. The yield increase from 5 T/A of fluorogypsum and phosphogypsum approached significance. The difference in yield between the two types of by-product gypsum was small. The increases in cane and sugar yields and average stalk weights from 10 T/A of fluorogypsum were significant. The yield increases were principally due to increases in the average stalk weights.

Date of Harvest

Experiments on date of harvesting current sugarcane varieties were conducted on the St. Gabriel Research Station. One test was initiated in 1985 to determine the effects of harvesting plant cane on the yield of the

following first stubble crop in 1986. Plant cane varieties CP 65-357, CP 70-321, CP 72-370 and CP 74-383 was harvested on September 1, October 1, November 1 and December 1 in 1985. The first stubble was harvested in November, 1986 and the yield data are reported in Table 11. Generally, the effects of data on harvesting plant cane on the yield of the following first stubble were similar with each variety. The September date produced the lowest yield and the December date produced the highest yield with each variety. The November harvest produced less cane than the October date with each variety except CP 74-383. As an average of varieties, the September harvest date produced significantly lower yield and the December date produced significantly more cane than the October and November harvest dates.

Another test was initiated to determine the effects of date of harvesting plant cane on the yield of plant cane in 1986 and first stubble cane in 1987. Plant cane of varieties CP 70-321, CP 72-370, CP 74-383 and CP 76-331 was harvested on September 1, October 6, November 11 and December 4 in 1986. The data obtained for the last three harvest dates are reported in Table 12. The increases in cane yield during the harvest season were positive with each variety and significant during October with CP 74-383. As an average of varieties, the increases in cane and sugar yields were significant during October and November. The average stalk weight and juice quality increased significantly from October to the December harvest date.

Stubble Protection

An experiment was conducted on stubble protection from freeze damage to possibly increase the yield and longevity of stubble cane. The protection treatments consisted of covering the cane stubble with approximately three inches of soil after harvesting a crop and a check plot without covering. The soil cover was applied prior to the occurrence of a freeze and the cover was removed in the spring with a stubble shaver.

Plant cane of varieties CP 65-357 and CP 72-370 was harvested on October 1, November 11 and December 9 in 1985 and the soil cover treatment was applied to the cane stubble of each variety immediately after each harvest date. The data obtained with first stubble in 1986 are reported in Table 13. The increases in cane yield due to the soil cover were larger with the October than the December harvest date of the two cane varieties. As an average of varieties, the soil cover treatment significantly increased the cane and sugar yields but not the yield components and juice quality of the cane.

Stubble Cane Longevity

A stubble longevity test was initiated with plant cane in 1985 and continued with first stubble in 1986 to study the effects of cane varieties, Furadan nematocide and stubble protection on stubble crop yields. The varieties were CP 70-321, CP 72-370 and CP 74-383 and the Furadan rates used were 0 and 10 pounds per acre. The Furadan was applied at planting time in 1984 and in the off-bar furrow in April, 1985 and 1986. The stubble protection which consisted of covering the cane stubble after harvesting the plant cane crop was applied in December, 1985. The test was harvested as first stubble in 1986 and plant and first stubble data are presented in Table 14. As an average of varieties, significant increases from Furadan occurred

in cane yield, stalk number and sugar yield of plant cane last year. In first stubble cane in 1986, the effect of Furadan was less pronounced. The yield increase from the soil cover was significant with each variety without Furadan and with CP 72-370 with Furadan. The effect of soil cover on yield was more without the use of Furadan.

Table 1. Effect of planting furrow width and rate of planting on plant cane yield of two varieties of sugarcane on a Commerce soil at the St. Gabriel Station, 1986.

| Variety of cane | Drill width | Rate of planting | Plant cane yield | Stalk | | Normal juice | | Sugar yield |
|---|---|---|---|---|---|---|---|---|
| | | | | No. | Wt. | Brix | Sucrose | |
| | in. | stalks | T/A | 1000/A | lbs. | % | % | lbs/A |
| CP 72-370 | V | 2 | 36.1 | 32.5 | 2.66 | 16.3 | 13.7 | 7036 |
| | 15 | 2 | 38.2 | 32.4 | 2.87 | 16.3 | 13.4 | 7213 |
| | 15 | 4 | 42.3 | 31.1 | 2.67 | 16.2 | 13.5 | 8065 |
| | 24 | 2 | 41.7 | 32.1 | 2.64 | 16.2 | 13.6 | 7998 |
| | 24 | 4 | 43.6 | 33.1 | 2.72 | 16.0 | 13.2 | 8121 |
| CP 76-331 | V | 2 | 44.2 | 29.1 | 3.04 | 18.0 | 15.1 | 9673 |
| | 15 | 2 | 43.6 | 29.4 | 2.96 | 17.7 | 14.9 | 9342 |
| | 15 | 4 | 47.5 | 32.8 | 2.90 | 17.8 | 15.0 | 10262 |
| | 24 | 2 | 46.4 | 31.0 | 3.00 | 17.6 | 14.8 | 9900 |
| | 24 | 4 | 52.2 | 33.5 | 3.12 | 18.1 | 15.2 | 11477 |
| HSD .05 | | | 3.7 | NS | NS | 1.1 | 1.1 | 1238 |

Rate of planting was the number of stalks planted in continuous lines with a 10% overlap.

Table 2. Effect of planting furrow width and rate of planting on first stubble cane yield of two varieties of sugarcane on a Commerce soil at the St. Gabriel Station, 1986.

| Variety of cane | Drill width | Rate of planting | Stubble cane yield | Stalk | | Normal juice | | Sugar yield |
|---|---|---|---|---|---|---|---|---|
| | | | | No. | Wt. | Brix | Sucrose | |
| | in. | stalks | T/A | 1000/A | lbs. | % | % | lbs/A |
| CP 65-357 | V | 2 | 37.5 | 31.0 | 2.53 | 17.3 | 14.5 | 7782 |
| | 15 | 2 | 38.3 | 33.9 | 2.55 | 17.4 | 14.6 | 8022 |
| | 15 | 4 | 41.9 | 35.2 | 2.55 | 17.9 | 15.2 | 9181 |
| | 24 | 2 | 39.0 | 34.9 | 2.49 | 17.6 | 14.9 | 8376 |
| | 24 | 4 | 40.1 | 34.1 | 2.46 | 17.6 | 14.9 | 8589 |
| CP 72-370 | V | 2 | 38.4 | 29.4 | 2.46 | 16.2 | 13.6 | 7393 |
| | 15 | 2 | 39.2 | 31.0 | 2.57 | 15.8 | 13.2 | 7242 |
| | 15 | 4 | 41.1 | 32.2 | 2.55 | 15.9 | 13.3 | 7685 |
| | 24 | 2 | 38.9 | 30.6 | 2.45 | 16.0 | 13.4 | 7348 |
| | 24 | 4 | 40.3 | 31.9 | 2.39 | 16.4 | 13.6 | 7750 |
| HSD .05 | | | 4.2 | NS | NS | 1.1 | 1.1 | 1008 |

Rate of planting was the number of stalks planted in continuous lines with a 10% overlap.

Table 3. Effect of date of planting on the plant cane yield of four varieties of sugarcane on Commerce soil on the St. Gabriel Station, 1986.

| Variety of cane | Date of planting | Plant cane yield | Stalk | | Normal juice | | Sugar yield |
|---|---|---|---|---|---|---|---|
| | | | No. | Wt. | Brix | Sucrose | |
| | | T/A | 1000/A | lbs. | % | % | lbs./A |
| CP 70-321 | Sept. 13 | 41.4 | 31.9 | 2.46 | 17.0 | 14.6 | 8683 |
| | Oct. 1 | 39.0 | 31.6 | 2.96 | 16.6 | 14.3 | 7959 |
| | Nov. 11 | 37.1 | 30.3 | 2.84 | 17.0 | 14.5 | 7714 |
| CP 72-370 | Sept. 13 | 37.4 | 30.3 | 2.38 | 16.7 | 14.1 | 7556 |
| | Oct. 1 | 37.5 | 29.7 | 2.66 | 16.7 | 14.0 | 7497 |
| | Nov. 11 | 32.0 | 26.1 | 2.69 | 16.0 | 13.3 | 5995 |
| CP 74-383 | Sept. 13 | 43.9 | 34.2 | 2.52 | 17.2 | 14.5 | 9159 |
| | Oct. 1 | 41.3 | 29.0 | 2.65 | 16.7 | 14.3 | 8434 |
| | Nov. 11 | 33.9 | 29.2 | 2.85 | 16.4 | 13.8 | 6640 |
| CP 76-331 | Sept. 13 | 40.8 | 34.2 | 2.93 | 17.6 | 15.0 | 8861 |
| | Oct. 1 | 35.8 | 29.6 | 3.00 | 17.7 | 14.8 | 7674 |
| | Nov. 11 | 37.7 | 30.6 | 3.11 | 17.6 | 14.8 | 8025 |
| HSD .05 | | 3.7 | NS | 0.51 | 1.5 | 1.4 | 1250 |
| | | Mean planting date effect | | | | | |
| | Sept. 13 | 40.9 | 32.6 | 2.6 | 17.1 | 14.6 | 8565 |
| | Oct. 1 | 38.4 | 30.0 | 2.8 | 16.9 | 14.4 | 7891 |
| | Nov. 11 | 35.2 | 29.1 | 2.9 | 16.8 | 14.1 | 7094 |
| HSD .05 | | 1.3 | 3.1 | 0.2 | NS | 0.5 | 431 |

Table 4. Effect of date of planting on the first stubble yield of four varieties of sugarcane on Commerce soil on the St. Gabriel Station, 1986.

| Variety of cane | Date of planting | Stubble cane yield | Stalk | | Normal juice | | Sugar yield |
|---|---|---|---|---|---|---|---|
| | | | No. | Wt. | Brix | Sucrose | |
| | | T/A | 1000/A | lbs. | % | % | lbs./A |
| CP 65-357 | Sept. 13 | 36.4 | 33.1 | 2.27 | 18.2 | 15.5 | 8166 |
| | Oct. 8 | 41.2 | 33.4 | 2.13 | 17.3 | 14.4 | 8512 |
| | Nov. 11 | 35.9 | 35.5 | 2.24 | 17.5 | 15.0 | 7624 |
| CP 70-321 | Sept. 13 | 36.9 | 33.3 | 2.18 | 17.3 | 14.6 | 7777 |
| | Oct. 8 | 40.8 | 33.2 | 2.20 | 16.9 | 14.5 | 8464 |
| | Nov. 11 | 37.0 | 32.4 | 2.20 | 17.2 | 14.7 | 7811 |
| CP 72-370 | Sept. 13 | 36.0 | 33.1 | 2.16 | 17.1 | 14.4 | 7422 |
| | Oct. 8 | 44.4 | 35.0 | 2.33 | 16.7 | 14.6 | 9297 |
| | Nov. 11 | 36.9 | 33.0 | 2.13 | 17.3 | 14.7 | 7799 |
| CP 74-383 | Sept. 13 | 37.0 | 37.4 | 2.06 | 17.4 | 14.8 | 7868 |
| | Oct. 1 | 44.7 | 34.4 | 2.15 | 17.4 | 14.8 | 9523 |
| | Nov. 11 | 41.8 | 35.5 | 2.27 | 17.3 | 14.6 | 8785 |
| HSD .05 | | 4.3 | NS | NS | NS | NS | 1454 |
| | | Mean planting date effect | | | | | |
| | Sept. 13 | 36.6 | 34.2 | 2.17 | 17.5 | 14.8 | 7808 |
| | Oct. 8 | 42.8 | 34.0 | 2.20 | 17.1 | 14.6 | 8949 |
| | Nov. 11 | 37.7 | 33.6 | 2.21 | 17.3 | 14.8 | 8005 |
| HSD .05 | | 1.4 | NS | NS | NS | NS | 501 |

Table 5. Effect of fall and spring applications of fertilizers and Furadan nematocide on the yield and yield components of first stubble cane from planting in succession without a fallow year on Commerce silt loam soil at the St. Gabriel Research Station, 1986.

| Fertilizer $N-P_2O_5-K_2O$ | | Stubble cane | Stalk | | Normal juice | | Sugar |
|---|---|---|---|---|---|---|---|
| Fall | Spring | yield | No. | Wt. | Brix | Sucrose | yield |
| lbs./A | lbs./A | T/A | 1000/A | lbs. | % | % | lbs./A |
| | | | Succession - No Furadan | | | | |
| 0-0-0 | 120-0-80 | 40.9 | 29.1 | 2.91 | 16.8 | 14.5 | 8505 |
| | 240-0-160 | 42.4 | 30.3 | 3.26 | 16.4 | 13.9 | 8370 |
| 90-90-90 | 120-0-80 | 40.0 | 31.3 | 2.73 | 16.4 | 14.1 | 8032 |
| | 240-0-160 | 42.0 | 30.6 | 2.74 | 16.2 | 13.7 | 8136 |
| | | | Succession - 10 lbs./A Furadan | | | | |
| 0-0-0 | 120-0-80 | 44.2 | 30.8 | 2.88 | 16.8 | 14.3 | 9061 |
| | 240-0-160 | 44.7 | 30.8 | 2.88 | 16.4 | 14.1 | 8972 |
| 90-90-90 | 120-0-80 | 39.6 | 30.1 | 2.77 | 17.0 | 14.5 | 8244 |
| | 240-0-160 | 40.5 | 30.4 | 3.07 | 16.6 | 14.1 | 8130 |
| HSD .05 | | 2.9 | NS | NS | NS | NS | 917 |

The succession cane was planted immediately following a harvested crop of second stubble cane in 1984. Cane variety CP 70-321 was planted in the test and the fall fertilizer and Furadan treatments were applied at planting time. The spring fertilizer and Furadan treatments were applied in April of 1985 and 1986. The cane was harvested in November of each crop year.

The extractable soil K, Ca, Mg and P were 117, 2036, 360 and 106 ppm, respectively, with a soil organic matter of 0.99% and pH 6.2.

Table 6. Effects of fall and spring applications of fertilizers, Furadan nematocide and Ridomil fungicide on the yield and yield components of plant cane planted on fallow land and in succession with another crop on Commerce silt loam soil at the St. Gabriel Research Station, 1986.

| Fertilizer N-$P_2O_5$-$K_2O$ | | Soil pesticide | Plant cane | Stalk | | Normal juice | Sugar |
|---|---|---|---|---|---|---|---|
| Fall | Spring | treat. | yield | No. | Wt. | sucrose | yield |
| -------lbs./A-------- | | | T/A | 1000/A | lbs. | % | lbs./A |
| | | | Fallow planted cane | | | | |
| 0-0-0 | 120-0-80 | check | 37.0 | 30.6 | 2.75 | 14.7 | 7782 |
| 0-0-0 | 120-0-80 | Ridomil | 36.0 | 31.7 | 2.76 | 14.7 | 7673 |
| 0-0-0 | 120-0-80 | Furadan | 39.3 | 30.2 | 2.98 | 14.0 | 7839 |
| 0-0-0 | 240-0-160 | Furadan | 38.7 | 30.6 | 3.08 | 14.3 | 7953 |
| | | | Succession planted cane | | | | |
| 0-0-0 | 120-0-80 | check | 32.3 | 26.8 | 2.78 | 14.4 | 6632 |
| 0-0-0 | 120-0-80 | Ridomil | 31.4 | 27.9 | 2.64 | 14.5 | 6546 |
| 0-0-0 | 120-0-80 | Furadan | 34.2 | 25.8 | 2.83 | 14.8 | 7253 |
| 0-0-0 | 240-0-160 | Furadan | 34.5 | 25.3 | 2.77 | 14.4 | 7146 |
| 90-90-90 | 120-0-80 | check | 42.3 | 28.5 | 2.67 | 14.7 | 8895 |
| 90-90-90 | 120-0-80 | Ridomil | 39.1 | 29.1 | 2.74 | 14.5 | 8153 |
| 90-90-90 | 120-0-80 | Furadan | 42.5 | 28.0 | 2.95 | 14.4 | 8763 |
| 90-90-90 | 240-0-160 | Furadan | 42.1 | 29.9 | 3.07 | 14.2 | 8529 |
| HSD .05 | | | 4.1 | 5.1 | NS | NS | 1079 |

The fallow cane was planted after a year without growing a crop and the succession cane was planted immediately after harvesting a cane crop in 1985. Cane variety CP 70-321 was planted in the test and the fall fertilizer and Furadan were applied at planting time. The spring fertilizer, Furadan and Ridomil were applied in April and the cane was harvested in November, 1986.

Application rates were 10 lbs/A Furadan and ½ pint/A for Ridomill.

The extractable soil K, Ca, Mg and P were 62, 1566, 277 and 249 ppm, respectively with soil organic matter of 1.47% and pH 6.8.

Table 7. Effect of rates and method of fertilizer application on the yield and yield components of plant cane on a Commerce silt loam soil at the St. Gabriel Station, 1986.

| Fertilizer applied $N-P_2O_5-K_2O$ | Method of application | Plant cane yield | Stalk | | Normal juice | | Sugar yield |
|---|---|---|---|---|---|---|---|
| | | | No. | Wt. | Brix | Sucrose | |
| lb./A | | T/A | 1000/A | lbs. | % | % | lbs/A |
| 0-0-0 | - | 26.1 | 25.0 | 2.49 | 17.1 | 14.0 | 5194 |
| 80-0-0 | Band | 29.1 | 28.3 | 2.63 | 16.7 | 13.4 | 5532 |
| 80-0-80 | Band | 33.4 | 29.3 | 2.67 | 17.2 | 14.0 | 6671 |
| 80-0-80 | BC | 28.8 | 27.4 | 2.72 | 17.4 | 14.4 | 5929 |
| 160-0-0 | Band | 30.9 | 28.4 | 2.64 | 17.5 | 14.2 | 6258 |
| 160-0-0 | BC | 30.4 | 28.6 | 2.55 | 17.7 | 14.6 | 6353 |
| 160-0-80 | Band | 30.8 | 28.4 | 2.85 | 17.0 | 13.9 | 6103 |
| 160-0-80 | BC | 30.7 | 28.7 | 2.59 | 17.2 | 13.9 | 6077 |
| 160-0-160 | Band | 32.9 | 29.4 | 2.68 | 17.0 | 14.2 | 6647 |
| 160-0-160 | BC | 36.3 | 29.2 | 2.64 | 17.4 | 14.2 | 7361 |
| HSD .05 | | 2.6 | NS | NS | NS | NS | 1307 |

BC = Broadcast

The experiment was conducted with variety CP 70-321 and the cane was fertilized in April and harvested in December, 1986. The band application was made in the off-bar furrow and the broadcast application was made on the entire soil surface of the plot.

Table 8. Effect of rate and method of fertilizer application on the yield and yield components of first stubble cane on a Commerce silt loam soil at the St. Gabriel Station, 1986.

| Fertilizer applied $N-P_2O_5-K_2O$ | Method of application | Stubble cane yield | Stalk | | Normal juice | | Sugar yield |
|---|---|---|---|---|---|---|---|
| | | | No. | Wt. | Brix | Sucrose | |
| lb./A | | T/A | 1000/A | lbs. | % | % | lbs/A |
| 0-0-0 | - | 21.6 | 22.6 | 2.01 | 16.6 | 13.7 | 3940 |
| 80-0-0 | Band | 29.5 | 30.4 | 2.27 | 16.7 | 13.7 | 5728 |
| 80-0-80 | Band | 30.7 | 28.7 | 2.38 | 16.9 | 14.0 | 6136 |
| 80-0-80 | BC | 30.2 | 29.4 | 2.37 | 16.8 | 13.9 | 5966 |
| 160-0-0 | Band | 31.9 | 30.5 | 2.19 | 16.5 | 13.2 | 5952 |
| 160-0-80 | Band | 31.5 | 30.0 | 2.15 | 17.2 | 14.3 | 6408 |
| 160-0-80 | BC | 30.4 | 31.0 | 2.18 | 17.0 | 14.0 | 6073 |
| 160-0-80 | Band | 31.4 | 30.9 | 2.29 | 16.7 | 14.1 | 6337 |
| 160-0-160 | BC | 30.6 | 30.2 | 2.36 | 17.0 | 14.0 | 6094 |
| HSD .05 | | 4.3 | 4.4 | NS | NS | NS | 1242 |

BC = Broadcast

The experiment was conducted with variety CP 74-383 and the cane was fertilized in April and harvested in December, 1986. The band application was made in the off-bar furrow and the broadcast application was made on the entire soil surface of the plot.

Table 9. Effect of rates of mined gypsum on the yield and yield components of first stubble cane on a Sharkey clay soil at Judice Farm in Iberia Parish, 1986.

| Gypsum applied | Stubble cane yield | Stalk | | | | Normal juice | | Sugar yield |
|---|---|---|---|---|---|---|---|---|
| | | No. | Wt. | Length | Dia. | Brix | Sucrose | |
| T/A | T/A | 1000/A | lbs. | in. | cm | % | % | lbs./A |
| 0 | 35.4 | 31.3 | 2.27 | 83 | 2.48 | 18.5 | 15.4 | 7923 |
| 1 | 37.6 | 30.0 | 2.51 | 86 | 2.56 | 18.6 | 15.6 | 8474 |
| 2.5 | 37.3 | 28.8 | 2.59 | 83 | 2.61 | 18.5 | 15.4 | 8318 |
| 5 | 39.2 | 30.5 | 2.57 | 86 | 2.55 | 18.4 | 15.4 | 8755 |
| 10 | 41.5 | 31.1 | 2.67 | 88 | 2.53 | 18.4 | 15.3 | 9203 |
| HSD .05 | 3.9 | NS | 0.10 | NS | 0.13 | NS | NS | 1125 |

Table 10. Effect of rates of by-product gypsum on yield and yield components of plant cane on a Sharkey clay soil at Cinclare Plantation in West Baton Rouge Parish, 1986.

| By-product gypsum applied[1/] | Plant cane yield | Millable stalk | | | Normal juice | | Sugar yield |
|---|---|---|---|---|---|---|---|
| | | No. | Wt. | Length | Brix | Sucrose | |
| T/A | T/A | 1000/A | lbs. | in. | % | % | lbs./A |
| 0 | 39.0 | 32.0 | 2.44 | 88 | 17.1 | 14.3 | 7989 |
| 1 | 42.4 | 33.1 | 2.57 | 91 | 17.1 | 14.4 | 8722 |
| 2 | 41.8 | 32.1 | 2.61 | 91 | 17.0 | 14.2 | 8502 |
| 5 | 43.0 | 31.3 | 2.75 | 90 | 17.6 | 14.7 | 9045 |
| 5 P | 43.2 | 32.0 | 2.74 | 91 | 17.2 | 14.5 | 8997 |
| 10 | 46.7 | 32.5 | 2.88 | 92 | 16.9 | 14.2 | 9432 |
| HSD .05 | 4.8 | NS | 0.34 | 6 | 0.6 | NS | 1102 |

1/ Fluorogypsum was used for all treatments except phosphogypsum was used for the 5 P treatment for comparison purposes.

Table 11. Effect of date of harvest plant cane on the yield of the subsequent stubble cane of four varieties on Commerce soil on the St. Gabriel Research Station, 1986.

| Variety of cane | Date of plant cane harvest | Stubble cane yield | Stalk | | Normal juice | | Sugar yield |
|---|---|---|---|---|---|---|---|
| | | | No. | Wt. | Brix | Sucrose | |
| | 1985 | T/A | 1000/A | lbs. | % | % | lbs./A |
| CP 65-357 | Sept. 1 | 30.2 | 29.3 | 2.27 | 17.3 | 14.4 | 6208 |
| | Oct. 1 | 35.9 | 31.8 | 2.26 | 17.2 | 14.1 | 7230 |
| | Nov. 1 | 33.4 | 30.5 | 2.13 | 17.1 | 13.9 | 6632 |
| | Dec. 1 | 39.3 | 31.3 | 2.30 | 17.7 | 14.7 | 8302 |
| CP 72-321 | Sept. 1 | 33.8 | 34.0 | 2.13 | 17.2 | 14.5 | 7021 |
| | Oct. 1 | 36.4 | 31.3 | 2.16 | 17.4 | 14.5 | 7591 |
| | Nov. 1 | 31.5 | 31.1 | 2.21 | 17.7 | 14.7 | 6672 |
| | Dec. 1 | 37.5 | 30.7 | 2.15 | 17.1 | 14.5 | 7814 |
| CP 72-370 | Sept. 1 | 32.1 | 26.8 | 2.17 | 17.2 | 14.2 | 6533 |
| | Oct. 1 | 35.8 | 29.3 | 2.23 | 16.9 | 14.0 | 7164 |
| | Nov. 1 | 32.8 | 27.2 | 2.16 | 16.7 | 13.8 | 6439 |
| | Dec. 1 | 35.0 | 30.4 | 2.21 | 17.0 | 14.1 | 7059 |
| CP 74-383 | Sept. 1 | 35.3 | 33.4 | 2.21 | 17.4 | 14.6 | 7390 |
| | Oct. 1 | 38.8 | 29.6 | 2.24 | 16.4 | 13.4 | 7352 |
| | Nov. 1 | 40.1 | 34.0 | 2.24 | 17.2 | 14.5 | 8329 |
| | Dec. 1 | 45.7 | 32.4 | 2.25 | 16.9 | 14.1 | 9190 |
| HSD .05 | | 4.1 | 5.7 | NS | 1.3 | NS | 1403 |
| | | Mean harvest date effect | | | | | |
| | Sept. 1 | 32.9 | 30.9 | 2.2 | 17.3 | 14.4 | 6788 |
| | Oct. 1 | 34.8 | 30.5 | 2.2 | 17.0 | 14.0 | 7334 |
| | Nov. 1 | 34.4 | 30.7 | 2.2 | 17.2 | 14.2 | 7018 |
| | Dec. 1 | 39.4 | 31.2 | 2.2 | 17.2 | 14.4 | 8091 |
| HSD .05 | | 1.5 | NS | NS | NS | NS | 511 |

Table 12. Effect of date of harvest on the yield of four varieties of plant cane on Commerce soil on the St. Gabriel Research Station, 1986.

| Variety of cane | Date of plant cane harvest 1986 | Plant cane yield T/A | Stalk wt. lbs. | Normal juice Brix % | Normal juice Sucrose % | Sugar yield lbs/A |
|---|---|---|---|---|---|---|
| CP 70-321 | Oct. 6 | 30.6 | 2.50 | 16.9 | 13.8 | 6020 |
| | Nov. 11 | 34.0 | 2.64 | 17.2 | 14.6 | 7116 |
| | Dec. 4 | 36.6 | 2.87 | 16.7 | 14.4 | 7514 |
| CP 72-370 | Oct. 6 | 31.4 | 2.13 | 16.7 | 13.2 | 5853 |
| | Nov. 11 | 32.2 | 2.33 | 17.2 | 14.2 | 6575 |
| | Dec. 4 | 33.8 | 2.43 | 17.1 | 14.8 | 7162 |
| CP 74-383 | Oct. 6 | 36.3 | 2.41 | 16.4 | 12.9 | 6569 |
| | Nov. 11 | 40.4 | 2.50 | 17.0 | 14.3 | 8228 |
| | Dec. 4 | 41.8 | 2.55 | 16.7 | 14.2 | 8504 |
| CP 76-331 | Oct. 6 | 41.2 | 2.62 | 17.0 | 13.5 | 7863 |
| | Nov. 11 | 40.3 | 2.63 | 17.6 | 14.4 | 8334 |
| | Dec. 4 | 42.2 | 2.71 | 18.0 | 15.4 | 9419 |
| HSD .05 | | 3.8 | 0.44 | 1.2 | 1.2 | 984 |
| | | Mean harvest date effect | | | | |
| | Oct. 6 | 34.9 | 2.41 | 16.7 | 13.4 | 6576 |
| | Nov. 11 | 36.7 | 2.53 | 17.2 | 14.4 | 7563 |
| | Dec. 4 | 38.6 | 2.64 | 17.1 | 14.7 | 8150 |
| HSD .05 | | 1.3 | 0.15 | 0.4 | 0.4 | 339 |

Table 13. Effect of stubble protection after three harvest dates of two cane varieties on the yield of the subsequent stubble crop on the St. Gabriel Research Station, 1986.

| Date of plant cane harvest 1985 | Stubble protection treatment | Stubble yield 1986 | Stalk | | Normal juice | | Sugar yield |
|---|---|---|---|---|---|---|---|
| | | | No. | Wt. | Brix | Sucrose | |
| | | T/A | 1000/A | lbs. | % | % | lbs./A |
| | | | CP 65-357 | | | | |
| Oct. 1 | Check | 34.5 | 30.6 | 2.12 | 18.1 | 14.8 | 7299 |
| | Cover | 38.1 | 33.8 | 2.08 | 18.1 | 14.9 | 8184 |
| Nov. 11 | Check | 34.4 | 33.4 | 2.05 | 18.2 | 14.9 | 7391 |
| | Cover | 38.3 | 33.1 | 2.23 | 17.8 | 15.0 | 8310 |
| Dec. 9 | Check | 34.0 | 32.3 | 2.20 | 17.9 | 15.2 | 7440 |
| | Cover | 35.6 | 33.6 | 2.17 | 17.8 | 14.8 | 7601 |
| | | | CP 72-370 | | | | |
| Oct. 1 | Check | 35.2 | 35.9 | 1.99 | 17.3 | 14.7 | 7403 |
| | Cover | 41.3 | 33.9 | 1.98 | 17.5 | 14.4 | 8541 |
| Nov. 11 | Check | 36.5 | 34.0 | 1.87 | 17.1 | 14.3 | 7503 |
| | Cover | 38.1 | 33.9 | 2.04 | 17.1 | 14.4 | 7872 |
| Dec. 9 | Check | 35.2 | 33.2 | 2.10 | 17.0 | 14.4 | 7284 |
| | Cover | 36.1 | 34.2 | 2.07 | 17.0 | 14.8 | 7997 |
| HSD .05 | | 4.5 | NS | NS | 1.1 | NS | 1301 |
| | | | Mean cover effect | | | | |
| | Check | 35.0 | 33.2 | 2.05 | 17.6 | 14.7 | 7387 |
| | Cover | 37.9 | 33.8 | 2.10 | 17.6 | 14.7 | 8034 |
| HSD .05 | | 1.0 | NS | NS | NS | NS | 302 |

The cane stubble was protected from freeze damage by covering it with soil immediately after each harvest date in 1985. The soil cover was removed in early spring and the stubble crop was harvested in November, 1986.

Table 14. Effect of varieties, Furadan and stubble protection on the yield of plant and first stubble cane on a Commerce silt loam soil at the St. Gabriel Research Station, 1985-86.

| Variety of cane | Stubble protection treatment | Plant cane - 1985 | | | 1st stubble - 1986 | | |
|---|---|---|---|---|---|---|---|
| | | Cane yield | Sucrose | Sucrose yield | Cane yield | Sucrose | Sugar yield |
| | | T/A | % | lbs./A | T/A | % | lbs./A |
| | | | No Furadan | | | | |
| CP 70-321 | Check | 34.4 | 13.7 | 6691 | 35.3 | 14.8 | 7533 |
| | Cover | - | - | - | 40.9 | 14.6 | 8580 |
| CP 72-370 | Check | 33.3 | 13.3 | 6245 | 33.8 | 14.2 | 6889 |
| | Cover | - | - | - | 39.5 | 13.6 | 7608 |
| CP 74-383 | Check | 44.7 | 12.5 | 7787 | 36.3 | 14.5 | 7575 |
| | Cover | - | - | - | 40.8 | 14.2 | 8301 |
| | | | Furadan - 10 lbs./A | | | | |
| CP 70-321 | Check | 36.8 | 14.0 | 7343 | 36.0 | 14.5 | 7512 |
| | Cover | - | - | - | 38.5 | 14.7 | 8147 |
| CP 72-370 | Check | 37.6 | 13.8 | 7352 | 33.0 | 14.4 | 6794 |
| | Cover | - | - | - | 39.1 | 14.2 | 7932 |
| CP 74-383 | Check | 45.2 | 12.9 | 8135 | 38.6 | 14.5 | 8049 |
| | Cover | - | - | - | 42.3 | 14.5 | 8805 |
| HSD .05 | | 3.5 | NS | 1168 | 4.4 | 0.8 | 1103 |

Stubble protection consisted of covering the cane stubble after harvesting the plant cane crop in 1985 and removing the cover in early spring of 1986.

# WINTER COVER CROPS FOR FALLOW YEAR PLANTING

Howard Viator
Iberia Research Station

## Introduction:

Most of the sugarcane fields with heavy, clay soil are characteristically low in organic matter and poor in tilth and internal drainage. An historical approach to improving the condition of these "midnight" soils is the incorporation of a legume cover crop grown during the fallow year. Austrian winter peas and soybeans have been the popular legumes for winter and summer, respectively. The atmospheric nitrogen fixed by the legume can significantly enhance the organic matter of the soil. In a 25+ year study comparing the relative value of winter legumes as a source of nitrogen for cotton, it was discovered that cotton yields following the use of hairy vetch as a cover crop equaled the yields following the application of 60 pounds of nitrogen per acre. Furthermore, the organic matter in the soil on which legumes were planted was about 15% higher than that supporting the fertilized cotton. Although this is a dramatic response and may not directly apply when similar crops are planted in rotation with cane, it does indicate the potential value of such rotations. The objective of this investigation, conducted by Dr. Clint Shock and Jackie Judice of Northside Planting Company near New Iberia, was to compare the productivity of the standard cool season legume, Austrian winter pea, with 17 alternatives.

## Cover crop yields and estimated nitrogen contribution:

As can be observed in Table 1, a number of cover crops exhibited significantly higher dry weight yields than Austrian winter pea. The highest yielding entries at both harvest dates (April 10 and April 27) and as an average of both harvests were Cahaba white common vetch and Bigbee berseem clover. Also productive was commercial hairy vetch, a legume which should be readily available at seed merchants. Time of incorporation for maximum biomass and nitrogen contribution appears to be a function of flowering date. For early plow down, Crimson clover appears to be a good choice because it was fully flowered and had more plant tops than the other legumes in early April. On the other hand, berseem clover and arrowleaf clover could be incorporated in May.

The three leading crops in dry matter production also possessed the greatest total nitrogen content in the plant tops at the April 27 harvest (Table 2). Cahaba white common vetch, Bigbee berseem clover, and commercial hairy vetch contained 99, 92 and 91 lbs N/acre, respectively. In this investigation, Austrian winter pea produced only 850 lbs of dry matter/acre and 12 lbs of N/acre. A late March infestation of aphids severely damaged several of the legumes, especially Austrian winter pea, and partially accounts for diminished yields.

Overall yields in the study were relatively low and may be attributable to a combination of the following factors - unfavorable soil fertility and weather conditions, possible herbicide residue damage, the aforementioned aphid infestation, and low pH.

Reported observations are for only one growing season and cannot serve as a basis for making recommendations. Growers experimenting with cool season cover crops may not achieve similar results.

TABLE 1. COOL SEASON PRODUCTIVITY OF COVER CROPS SEEDED IN A SUGARCANE STUBBLE FIELD, NEW IBERIA, LA 1983-84.

| Cover crop | April 10 harvest | April 27 harvest | Greatest DW yields |
|---|---|---|---|
| | - - - - - - lbs DW/acre - - - - - - | | |
| Cahaba white common vetch | 2050 | 4650 | 4650 |
| Bigbee berseem clover | 2190 | 3980 | 3980 |
| Hairy vetch (commercial) | 1420 | 3450 | 3450 |
| Hairy vetch (experimental) | 1700 | 2980 | 2980 |
| Mt. Barker subclover | 1220 | 2910* | 2910 |
| Tibbee crimson clover | 2720 | --- | 2720 |
| Caley pea | 1240 | 2710 | 2710 |
| Amclo arrowleaf clover | 1890 | 2600 | 2600 |
| Big flower vetch | 1760 | 2450* | 2450 |
| Austrian winter pea (experimental) | 850 | --- | 850 |
| Chesapeake red clover | 320 | 790* | 790 |
| Austrian winter pea (commercial) | 740 | --- | 740 |
| Abon persian clover | 520 | 500 | 520 |
| Segrest ball clover | --- | --- | --- |
| Sour clover | --- | --- | --- |
| Bur clover | --- | --- | --- |
| Blue lupine | --- | --- | --- |
| Button clover | --- | --- | --- |
| Gulf annual ryegrass | 380 | 760 | 760 |
| LSD (.05) | 490 | 780 | 740 |

*Mostly dry and shattered by this date. Harvests were not made.

TABLE 2. NITROGEN CONTENT IN PLANT TOPS OF COVER CROPS AND ESTIMATED NITROGEN FIXED BY COVER CROPS. NEW IBERIA, LA.

| Cover crop | Percent nitrogen in plant tops | | Total nitrogen contained in plant tops | | Nitrogen fixed estimated from plant tops | |
|---|---|---|---|---|---|---|
| | April 10 | April 27 | April 10 | April 27 | April 10 | April 27 |
| | - - - - % - - - - - | | - - lbs N/acre - - | | - - lbs N/acre - - | |
| Cahaba white common vetch | 3.0 | 2.1 | 60 | 99 | 56 | 90 |
| Bigbee berseem clover | 2.6 | 2.3 | 58 | 92 | 54 | 83 |
| Hairy vetch (commercial) | 3.1 | 2.7 | 44 | 91 | 40 | 82 |
| Hairy vetch (experimental) | 2.9 | 2.4 | 50 | 72 | 46 | 63 |
| Mt. Barker subclover | 3.0 | 2.1 | 36 | 61 | 32 | 52 |
| Tibbee crimson clover | 2.3 | --- | 61 | -- | 57 | -- |
| Caley pea | 3.2 | 3.2 | 38 | 87 | 34 | 78 |
| Amclo arrowleaf clover | 2.6 | 1.9 | 49 | 48 | 45 | 39 |
| Big flower vetch | 2.6 | 1.9 | 46 | 47 | 42 | 38 |
| Austrian winter pea (experimental) | 2.2 | --- | 19 | -- | 15 | -- |
| Chesapeake red clover | 3.2 | 2.9 | 10 | 23 | 6 | 14 |
| Austrian winter pea (commercial) | 2.1 | --- | 16 | -- | 12 | -- |
| Abon persian clover | 3.1 | 3.4 | 16 | 20 | 12 | 11 |
| Gulf annual ryegrass | 1.2 | 1.2 | 4 | 9 | -- | -- |
| LSD (.05) | 0.2 | | 12 | | 12 | |

# Sugarcane Insects Ecology and Pest Management

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## IPM Utilization of Multiple Management Tactics:

To evaluate the relative contributions of varietal resistance, predation, and insecticidal control of the sugarcane borer (SCB), Diatraea saccharalis (F.), a split-split plot treatment arrangement was employed with 4 replications of three commercial varieties of sugarcane, resistant (CP70-330), moderate (CP65-357), and susceptible (CP61-37), and plots with and without arthropod predators. The sub-sub-plot level compared insecticide-treated and non-treated plots for control of SCB, based on an economic threshold of 5% of the stalks containing live SCB larvae in the leafsheaths. Evaluation of varietal resistance as a sole management tactic across all treatment combinations demonstrated a 3.6 fold reduction in damage by the sugarcane borer and a 11.6 fold reduction in adult production as shown in Table 1. Arthropod predation contributed 1.9 and 3.2 fold reductions; and timely application of insecticides provided 8.4 and 10.8 fold reductions in damage and moth production, respectively. A combination of all three management tactics was found to be additive and reduced damage 57 fold and moth production more than 330 fold.

Table 1.--Contribution of varietal resistance and predation in reducing sugarcane borer populations and damage to sugarcane. St. Gabriel, LA, 1986.[a]

| Sugarcane Variety | Predators (+/-)[b] | Appl Pydrin (+/-) | % SCB Bored Internodes | Moth production per ha | Tons of sugar per hectare | % Sucrose in juice |
|---|---|---|---|---|---|---|
| CP61-37 | - | - | 50.22a | 110,395a | 5.37a | 14.2h |
| CP65-357 | - | - | 46.98a | 48,281c | 5.95de | 16.2def |
| CP70-330 | - | - | 19.13c | 19,231de | 6.54bcd | 16.0ef |
| CP61-37 | + | - | 30.66b | 66,403b | 6.06d | 15.1g |
| CP65-357 | + | - | 29.55b | 23,012d | 6.45cd | 16.4cde |
| CP70-330 | + | - | 8.69d | 3,372g | 7.06ab | 16.8cd |
| CP61-37 | - | + | 8.23de | 13,878e | 6.25cd | 14.2h |
| CP65-357 | - | + | 5.68e | 4,146f | 7.52a | 17.6a |
| CP70-330 | - | + | 1.98g | 1,590fg | 7.08ab | 16.9bc |
| CP61-37 | + | + | 3.43f | 3,968f | 7.25a | 15.7fg |
| CP65-357 | + | + | 3.86f | 3,696f | 6.90abc | 16.2def |
| CP70-330 | + | + | 0.88h | 324g | 7.55a | 17.3ab |

[a] Means within a column followed by the same letter are not significantly different (DMRT P = 0.05).
[b] Predators were suppressed using Chlordane @ 2.2 lb ai/ha.

Interdisciplinary Effects on Predation Ecology:

Completion of a 2 year, 6 replication study designed to apply ecological theory to the practice of integrated pest management showed that diversification of certain annual weeds (which are shaded out when the sugarcane canopy closes) increased predatory insects including fire ants, Solenopsis invicta Buren. SCB bored internodes were reduced to 16.4 and 16.5% (weedy) versus 30.3 and 35.1% in respective 1985 and 1986 weed free plots of the variety CP72-383. Corresponding numbers of fire ant colonies per ha. in the respective plant and 1st ratoon crop years of these habitats were 84.4 and 200.4 (weedy) compared to 7.0 and 56.3 in weed free plots.

Total phytophagous nematode levels were not significantly suppressed by a pre-season aldicarb application, and nematode populations appeared to resurge by the end of each season to levels that surpassed those encountered in untreated sugarcane. Aldicarb-free phytophagous nematode abundances were not influenced by the presence of weeds in interstool gaps, but the sugarcane rhizosphere in weedy plots tended to harbor fewer total phytophagous nematodes than in plots devoid of weed growth. Sugarcane free amino acid concentrations were significantly reduced in the presence of weeds, and a significant ($P < 0.05$) linear relationship was found between levels of free cystiene and Tylenchorhynchus nematode species. A significant ($P < 0.05$) weed-sugarcane mosiac virus interaction was identified when free cystiene accumulations in sugarcane were analyzed. Because Tylenchorhynchus, Crisconemoides, and total phytophagous nematode abundances tended to mirror the cystiene response to weed and virus induced stress, our results suggest that these taxa were influenced by cystiene fluctuations.

An additional 2-year predation ecology (3X4 factorial) study revealed that early harvested sugarcane fields sustained higher ant populations than those which were late-harvested and late-planted; that crop residue, fall and/or spring weeds facilitated substantially higher populations and winter survival of natural enemies; and that foraging tunnel construction and S. invicta colony survival were aided by certain edaphic characteristics of clay soils. Thus, an improved pest management program would include considerations regarding the placement of resistant and susceptible varieties relative to cultural practices and soil conditions enhancing predation.

Host Plant Studies and Varietal Resistance:

The L83 series were extensively evaluated in both 1985 (26 cultivars) and 1986 (11 cultivars) for resistance to SCB based on both damage (% bored internodes), and non-bioassay methods for determining rind hardness. During 1986 season there were higher SCB populations exerting more pressure on these cultivars. Only a moderate degree of correlation was observed between the results of the two years illustrating the need for several years of replication to provide the necessary quantifications of SCB susceptibility to sugarcane cultivars utilizing standard bioassay.

SCB plant resistance evaluations (15 reps-5 locations) of L/CP 79-, 80-, and 81- varietal series revealed that CP 79-318, L/CP 81-10 and L/CP 81-30 varieties were comparable to the commercial moderate CP 65-357. Natural infestations (one location) on highly susceptible varieties caused greater

than 40% SCB bored internodes in varieties CP 79-332 and CP 80-323, and the newly released CP 76-331 exceeded 50% SCB bored internode damage.

Studies on the development of an economic threshold for the SCB on sweet sorghum showed that yields were reduced by the borer up to 46%. The regression of total sugars by % SCB bored internodes, $Y = 6{,}648 - 41.4 \times$ ($r^2 = 0.85$, $P < 0.007$), led to the establishment of an economic threshold of 5% live larvae infesting the leaf sheaths for determining the need for SCB insecticidal control.

Insecticide Control Studies:

Small-plot screening studies for control of SCB in sugarcane comparing 6 replications of monocrotophos (5L - 0.84 kg ai/ha), alsystin (4F - 0.1), flucythrinate (2E - 0.03), fenvalerate (2.4E - 0.1), and Asana (1.9E - 0.03) showed that the synthetic pyrethroid rates tested (the latter 3 chemicals) were more effective for control of SCB ($P < 0.05$) than the standard azinphos-methyl (2L - 0.84 kg ai/ha). In sweet sorghum at the above rates the respective % control with the chemicals were monocrotophos (88%), alsystin (77%), flucythrinate (68%), fenvalerate (67%), and Asana (61%) as contrasted with 62.3% control with azinphosmethyl in 2 applications.

Research Personnel:

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# Sweet Sorghum for Biomass and Sugar Production in Louisiana

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Experiments were conducted in 1986 to determine the potential of growing sweet sorghum as a biomass and sugar fermentation feedstock for the production of fuel alcohol. The experiments consisted of a variety test on Commerce silt loam soil at the St. Gabriel Research Station and a variety x fertilizer test on an Iberia clay soil at the Iberia Research Station.

## St. Gabriel Test

The varieties planted in this test were Wray, Keller, Theis, M81E, Mer. 76-6, Mer. 71-1 and Cowley. The sorghum plots were planted in April and each variety was harvested at its mature stage. The plots were planted in two drills, 22 inches apart on rows spaced six feet apart. The plant spacing was three plants per foot in each drill. The plots were three rows wide and 50 feet long with three replications of each variety. This method of planting was chosen to accommodate sugarcane harvesting equipment.

A 13-13-13 fertilizer at the rate of 500 pounds per acre was bedded in the rows prior to planting. Ammonium nitrate at the rate of 500 pounds per acre was applied as a top-dress application when the plants were about 10 inches tall. Atrazine was used as a preemergence herbicide and Guthion was used to control sugarcane borers. Furadan was applied at planting time to control lesser corn borers.

The yield components and yield of stalks, leaves and tops were measured at the mature stage of each variety. The percent brix or total sugar solids and sucrose in the sorghum juice and percent fiber in the stalks were measured at harvest time of each variety. The brix and sucrose were determined with a refractometer and polariscope, respectively. The total fermentable sugars were calculated from a predetermined relationship between liquid chromatograph analyses for total sugars and brix analyses expressed by the equation % total sugars = % Brix - .70. The alcohol yield was calcualted from the theoretical conversion of .07 gallon of alcohol per pound of fermentable sugar.

Biomass yield. The data obtained on biomass yield in the St. Gabriel test are reported in Table 1. The plant population on each plot was adjusted by thinning to three plants per foot in each drill and the differences in population at harvest time were due to differences in stooling and survival ability of the plants. Apparently, the Wray variety had a higher mortality and/or less stooling than the other varieties. The average stalk weight ranged from 0.92 pound with Keller to 1.82 pounds with M81E.

The fiber content in the stalks which indicates percent juice extraction ranged from 14.9% with Mer 76-6 to 19.8% with Cowley. The percent fiber was unusually high in all varieties this year. The net stalk yield without leaves and tops ranged from 17.5 T/A with Keller to 28.0 T/A with M81E averaging for

all varieties 79.5% of the total plant weight. The percent leaves which were mostly still green at harvest ranged from 10.7% with Theis to 19.3% with Cowley. The percent tops which included the seed heads, ranged from 2.9% with Wray to 9.2% with Mer. 76-6. The Mer. 76-6 is a high seed producer as compared to Wray. The total biomass yield, which included the stalks, leaves and tops ranged from 21.4 T/A with Wray to 34.1 T/A with M81E.

There were significant differences among the varieties in each biomass yield component measured in this test.

Sugar and alcohol yield. The sugar and alcohol yield data obtained for each variety in the St. Gabriel test are reported in Table 2. The brix, sucrose and total sugars in the sorghum juice are expressed as percent of stalk weight and not as percent of extracted juice. The percent brix or total sugar solids ranged from 13.2% in M81E to 18.4% in Keller and Theis to 15.3% in Keller. The total fermentable sugars and alcohol yields were lowest with Wray producing 5826 lbs./A and 408 gal./A, respectively and highest with Mer. 71-1 producing 7406 lbs./A and 518 gal./A, respectively.

There were significant differences among the varieties in each sugar yield component measured in this test.

Iberia Test

The test on the Iberia Research Station consisted of six sweet sorghum varieties and two fertilizer treatments with each variety. The varieties were Wray, Keller, Theis, M81E, Mer. 76-6 and Cowley. The fertilizer treatments were 150 lbs./A of N at planting time and a split N application of 100 lbs./A at planting time plus 50 lbs./A as a side dress when the sorghum was 12 inches tall. The sorghum was planted in April in single drills on rows 40 inches wide and each variety was harvested at its mature stage. Plant spacing was three plants per foot in each drill. The plots were four rows wide and 30 feet long with four replications of each treatment. The cultural practices and experimental procedures used in this test were similar to the ones described above for the St. Gabriel test.

Biomass yield. The data obtained on biomass yield in the Iberia Station test are reported in Table 3. The differences in stalk population at harvest time were not significant. The average millable stalk weight ranged from 0.79 pound with Keller to 1.86 pounds with Mer. 76-6. The stalk fiber ranged from 12.0% with Mer. 76-6 to 15.1% with Keller. The net stalk yield ranged from 14.9 T/A with Keller to 28.3 T/A with Mer. 76-6. The percent leaves ranged from 5.7% with Theis to 14.1% with Cowley. The percent tops ranged from 3.7% with Theis to 6.5% with Mer. 76-6. The total biomass yield including stalks, leaves and tops ranged from 17.3 T/A with Keller to 33.8 T/A with Mer. 76-6.

Factorial analysis of variance showed that there were significant differences among varieties in each biomass yield component except in stalk population and between fertilizer treatments only in stalk population. The split N fertilizer treatment produced less stalk population than the treatment with all the N fertilizer at planting time.

Sugar and alcohol yield. The sugar and alcohol yield data obtained in the Iberia Station test are reported in Table 4. The sugar contents are expressed as percent of total stalk weight. The percent brix, sucrose and total sugars ranged from 9.7, 2.3 and 9.3%, respectively with Theis to 18.1, 15.3 and 17.4%, respectively with Keller. The total fermentable sugars and alcohol yields were lowest with Theis producing 4543 lbs./A and 318 gal./A, respectively and highest with Cowley producing 8014 lbs./A and 561 gal./A, respectively.

Factorial analysis of variance showed that there were significant differences among varieties in each sugar component and alcohol yield. There were significant differences between fertilizer treatments and a significant variety x fertilizer interaction in sucrose content. The split N treatment produced less sucrose with Theis and more sucrose with M81E than the treatment with all the N applied at planting time.

Table 1. Effect of varieties on the biomass yield of sweet sorghum at maturity on a Commerce silt loam soil on the St. Gabriel Research Station, 1986.

| Sweet sorghum variety | Stalk No. 1000/A | Stalk Wt. lbs. | Stalk fiber % | Stalk fiber T/A | Stalk yield % | Stalk yield T/A | Leaves yield % | Leaves yield T/A | Tops yield % | Tops yield T/A | Total yield T/A |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Wray | 31.5 | 1.15 | 16.3 | 2.9 | 82.1 | 17.6 | 15.0 | 3.2 | 2.9 | 0.6 | 21.4 |
| Keller | 35.7 | 0.92 | 18.2 | 3.2 | 77.8 | 17.5 | 18.8 | 4.2 | 3.4 | 0.8 | 22.5 |
| Theis | 38.1 | 1.58 | 18.0 | 4.6 | 84.3 | 25.7 | 10.7 | 3.3 | 5.0 | 1.5 | 30.5 |
| M81E | 40.5 | 1.82 | 15.7 | 4.4 | 82.2 | 28.0 | 13.4 | 4.6 | 4.4 | 1.5 | 34.1 |
| Mer. 76-6 | 40.6 | 1.28 | 14.9 | 3.5 | 73.0 | 23.5 | 17.8 | 5.8 | 9.2 | 2.9 | 32.2 |
| Mer. 71-1 | 38.8 | 1.24 | 16.0 | 4.0 | 79.9 | 24.6 | 17.0 | 5.2 | 3.0 | 0.9 | 30.7 |
| Cowley | 37.3 | 1.29 | 19.8 | 4.3 | 76.9 | 21.9 | 19.3 | 5.5 | 3.7 | 1.1 | 28.5 |
| HSD 5% | 5.7 | 0.52 | 2.0 | 1.2 | 4.5 | 4.9 | 5.0 | 1.6 | 2.7 | 0.8 | 5.9 |

Table 2. Effect of varieties on the sugar and alcohol yield of sweet sorghum on a Commerce silt loam soil on the St. Gabriel Research Station, 1986.

| Sweet sorghum variety | Sugar yield in stalks at maturity | | | | | Alcohol yield |
|---|---|---|---|---|---|---|
| | Brix | Sucrose | | Total sugars | | |
| | % | % | lbs./A | % | lbs./A | gal./A |
| Wray | 17.2 | 14.1 | 4947 | 16.6 | 5826 | 408 |
| Keller | 18.4 | 15.3 | 5343 | 17.7 | 6201 | 434 |
| Theis | 14.0 | 8.3 | 4282 | 13.5 | 6929 | 485 |
| M81E | 13.2 | 8.8 | 4954 | 12.8 | 7155 | 501 |
| Mer. 76-6 | 15.1 | 10.6 | 5005 | 14.5 | 6860 | 480 |
| Mer. 71-1 | 15.7 | 11.4 | 5596 | 15.1 | 7406 | 518 |
| Cowley | 16.5 | 13.5 | 5918 | 15.9 | 6969 | 488 |
| HSD 5% | 1.8 | 2.2 | 1586 | 1.7 | 1490 | 104 |

Sugar content expressed as percent of stalk weight.

Table 3. Effect of varieties and fertilizer on the biomass yield of sweet sorghum at maturity on an Iberia clay soil on the Iberia Research Station, 1986.

| Sweet sorghum variety | Fertilizer[1/] N lbs. | Stalk No. 1000/A | Stalk Wt. lbs. | Stalk fiber % | Stalk fiber T/A | Stalk yield % | Stalk yield T/A | Leaves yield % | Leaves yield T/A | Tops yield % | Tops yield T/A | Total yield T/A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Wray | 150 | 33.1 | 0.97 | 13.7 | 2.4 | 85.5 | 17.7 | 10.1 | 2.1 | 4.4 | 0.9 | 20.6 |
| | 100+50 | 31.9 | 0.95 | 13.6 | 2.3 | 85.9 | 17.1 | 10.3 | 2.1 | 3.9 | 0.8 | 19.9 |
| Keller | 150 | 34.7 | 0.81 | 15.1 | 2.5 | 86.6 | 16.7 | 10.7 | 2.1 | 4.8 | 0.9 | 19.7 |
| | 100+50 | 30.3 | 0.79 | 15.1 | 2.3 | 86.2 | 14.9 | 9.7 | 1.7 | 4.1 | 0.7 | 17.3 |
| Theis | 150 | 34.5 | 1.63 | 12.2 | 3.0 | 90.6 | 24.4 | 5.7 | 1.5 | 3.7 | 1.0 | 27.0 |
| | 100-50 | 32.4 | 1.45 | 12.4 | 3.1 | 91.0 | 24.4 | 5.2 | 1.4 | 3.8 | 1.0 | 26.9 |
| M81E | 150 | 35.9 | 1.58 | 12.3 | 3.3 | 87.7 | 26.8 | 8.1 | 2.5 | 4.2 | 1.3 | 30.5 |
| | 100+50 | 34.4 | 1.48 | 12.1 | 3.4 | 86.2 | 28.1 | 9.3 | 3.0 | 4.5 | 1.4 | 32.5 |
| Mer. 76-6 | 150 | 36.1 | 1.69 | 12.7 | 3.6 | 83.7 | 28.3 | 9.9 | 3.4 | 6.5 | 2.2 | 33.8 |
| | 100+50 | 31.1 | 1.86 | 12.0 | 3.2 | 84.2 | 27.2 | 9.7 | 3.1 | 6.2 | 2.0 | 32.3 |
| Cowley | 150 | 36.1 | 1.36 | 13.9 | 3.3 | 80.8 | 23.7 | 14.1 | 4.2 | 5.1 | 1.5 | 29.4 |
| | 100+50 | 34.4 | 1.50 | 14.3 | 3.4 | 82.0 | 23.4 | 12.7 | 3.7 | 5.3 | 1.6 | 28.6 |
| HSD .05 | | NS | 0.35 | 2.4 | 0.7 | 3.8 | 3.4 | 3.5 | 1.1 | 1.4 | 0.4 | 4.2 |

1/ Fertilizer treatments were 150 lbs./A N at planting time and a split application of 100 lbs. at planting plus 50 lbs./A as a side dress.

Table 4. Effect of varieties and fertilizer on the sugar and alcohol yield of sweet sorghum on an Iberia clay soil on the Iberia Research Station, 1986.

| Sweet sorghum variety | Fertilizer N lbs./A | Sugar yield in stalks at maturity | | | | | Alcohol yield gal./A |
|---|---|---|---|---|---|---|---|
| | | Brix % | Sucrose % | Sucrose lbs./A | Total sugars % | Total sugars lbs./A | |
| Wray | 150 | 18.0 | 15.1 | 5332 | 17.3 | 6119 | 429 |
| | 100+50 | 17.9 | 15.0 | 5138 | 17.3 | 5919 | 414 |
| Keller | 150 | 18.1 | 15.3 | 5090 | 17.4 | 5819 | 408 |
| | 100+50 | 18.0 | 15.1 | 4486 | 17.4 | 5165 | 362 |
| Theis | 150 | 11.4 | 7.7 | 3737 | 11.0 | 5386 | 377 |
| | 100+50 | 9.7 | 2.3 | 1098 | 9.3 | 4543 | 318 |
| M81E | 150 | 11.1 | 5.2 | 2790 | 10.7 | 5714 | 400 |
| | 100+50 | 12.8 | 7.4 | 4176 | 12.3 | 6913 | 484 |
| Mer. 76-6 | 150 | 13.2 | 5.5 | 3142 | 12.7 | 7200 | 504 |
| | 100+50 | 13.4 | 5.8 | 3140 | 12.9 | 7009 | 491 |
| Cowley | 150 | 17.6 | 14.2 | 6713 | 16.9 | 8014 | 561 |
| | 100+50 | 17.2 | 13.9 | 6489 | 16.6 | 7765 | 544 |
| HSD .05 | | 1.6 | 1.8 | 1258 | 1.6 | 1357 | 95 |

Sugar content expressed as percent of stalk weight.

# A Comparison of Two Methods of Estimating Yield in Sugarcane[1/]

J. P. Quebedeaux and F. A. Martin

A comparison was made between two methods of estimating yield in sugarcane. The "stalk number/weight" method (stalk number x average stalk weight) was compared to the "weighed plot" method. Over seven varieties, a highly significant, positive association was found between the two methods of estimating tons cane per acre, sugar per acre, and number of stalks per acre ($r=0.80^{**}$, $0.80^{**}$, and $0.84^{**}$ respectively). The stalk number/weight method generally gave a higher estimate than the weighed plot method of estimating yield. The results from this machine-cut experiment closely agree with those from a similar hand-cut experiment reported by Dr. Hebert in 1963.

Within each variety the comparison was made between the counted number of stalks per plot and the number of stalks estimated by dividing the plot weight by the mean stalk weight. The association varied by variety. Using CP 72-356, a poor mechanical harvesting variety, a nonsufficient low association ($r=.38$) between the two methods of estimating the number of stalks per acre was found. Using CP 72-370, a variety that is considered to be intermediate in suitability to mechanical harvesting, a moderate association ($r=0.64^{*}$) between the two methods of estimating the number of stalks per acre was noted. When CP 65-357, a variety that is considered to be well suited to mechanical harvesting was used, a highly significant association ($r=0.93^{**}$) between the two methods of estimating number of stalks per acre was found.

Since sugarcane is mechanically harvested in Louisiana and varieties differ in their suitability to mechanical harvesting, estimates of yield via the weighed plot method after machine cutting gives an integrated estimate of pre-harvesting yield and harvesting efficiency. From the results of this study, it can be proposed that if both the stalk number/weight method and the weighed plot method of estimating yield were used in replicated variety trials, more accurate assessment of a varietie's yield potential and its suitability to mechanical harvesting could be made.

1/ This research was partially funded by a grant from the American Sugar Cane League.

# Estimating the Ratooning Ability of Sugarcane Varieties in Louisiana[1/]

J. P. Quebedeaux and F. A. Martin

To test the hypothesis that the ratooning ability of sugarcane varieties can be predicted in the first ratoon year by subjecting the plant cane crop to multiple cuttings, seven Louisiana commercial varieties of known ratooning ability were subjected to four cutting regimes in the plant cane year. Varietal yields, measured in terms of number of stalks per acre, tons cane per acre and sugar per acre, were statistically analyzed and compared to observed commercial performance.

Varietal rank in ratooning based on the number of stalks per acre in the first stubble crop after cutting in early September and again in late November of the plant cane year (regime S) closely matched the ratooning experienced across the Louisiana sugarcane industry. The good ratooning varieties in the test, CP74-383 and CP72-356, yielded significantly higher number of stalks per acre than all moderate and poor ratooning varieties in the test. The two poor ratooning varieties yielded the lowest number of stalks per acre, with L62-96 yielding a significantly lower number than all the moderate ratooning varieties. CP70-330, while not significantly lower than the moderate ratooning varieties, was numerically similar to L62-96 in number of stalks per acre.

When estimating the number of stalks per acre in the check treatment cut only in November (regime N), the ranking of the varieties again matched their ratooning behavior in the sugarcane industry. The two good ratooning varieties yielded the highest number of stalks per acre and the two poor ratooning varieties yielded the lowest number of stalks per acre. However, the differences between the varieties were not large enough to statistically differentiate between the categories of ratooning ability.

The percent of the plant cane crop (number of stalks per acre) that returned in the first ratoon year was calculated and the performance of the varieties in regime S and N again closely matched their ratooning performance in the Louisiana sugarcane industry. In both treatments, the good ratooning varieties showed a greater return percentage than the moderate and poor ratooning varieties. One poor ratooning variety, CP70-330, showed a significantly lower return than at least two moderate ratooning varieties.

When estimating yield in tons cane per acre or sugar per acre, neither of the four cutting regimes used effectively separated the varieties into their respective categories of ratooning ability. Significant interactions between the varieties and cutting regimes caused changes in varietal rank among the cutting regimes, especially with the moderate and poor ratooning varieties. The good ratooning varieties generally performed better under all treatments. CP74-383, an excellent ratooning variety in the Louisiana sugarcane industry, showed the highest yield (number of stalks per acre, tons cane per acre, and sugar per acre) under all cutting regimes. These results indicate that putting additional cutting stress on sugarcane varieties is probably not an effective method of predicting ratooning ability amongst the less than superior ratooning varieties, but may be of some use in selecting superior ratooning varieties.

1/ This research was partially funded by a grant from the American Sugar Cane League.

# A Study of the Heritability of Flowering in Sugarcane

Imran Mohammad, A. M. Saxton, J. D. Miller and F. A. Martin

A three year study using natural flowering at Canal Point, Florida indicated that the date of first flowering, date of maximum flowering, average flowering date, and percent of stalks flowering were highly heritable traits. The heritabilities of these flowering-related traits were investigated in sugarcane crosses involving early-, mid-, and late-flowering parents in all possible combinations.

Partitioning of total direct response in parental lines into average direct and maternal genetic effects indicated that average maternal genetic effects of the early and late lines were larger in magnitude for all characters studied. Average direct genetic effects of the early line were important in reducing the dates of first flowering, maximum flowering, and average flowering. Similarly the average direct genetic effects of the late line delayed these dates. Average maternal genetic effects of the early and late lines were much larger than the average direct genetic effects of these lines for the dates of first flowering, maximum flowering, and average flowering.

The average performance of a line in crosses is measured by its general combining ability, which includes average direct genetic effects and line heterotic effects. Mid-flowering lines exhibited larger general combining ability for the date of first flowering, date of maximum flowering, and average flowering date. Mid-flowering line significantly delayed the date of first flowering and significantly reduced percent flowering. Early-flowering line significantly increased percent flowering and numerically decreased the dates of first flowering, maximum flowering and average flowering. Though negative in direction, the magnitude of the genetic effects of the late line was much smaller than the early and mid lines. All of the lines showed highly significant general combining ability effects. Hence, the additive effects may be more important for the flowering traits than the non-additive effects.

The results of this study offers clarification of flowering behavior in Late by Early and Late by Late crosses. Late flowering varieties of sugarcane are generally induced to flower via controlled photoperiod conditions. Concern has been that excessive use of late flowering lines in sugarcane breeding would result in increases in the dates of flowering of the progencies of such crosses. The results of this study indicated that the progencies of late flowering clones generally flower earlier and more profusely than the later flowering parent.

# The Response of Saccharum Species to Growth Regulators Used as Tillering Agents[1/]

K. P. Bischoff and F. A. Martin

The main objective of this study was to identify those tillering agents that cause the greatest increase in shoot number without adversely affecting the growth rate of the treated cultivars. It was also designed to identify those basic genotypes of the genus Saccharum that exhibit a high degree of response to those growth regulators that have shown efficacy as tillering agents in sugarcane.

A series of three factorial experiments was conducted under controlled conditions in the greenhouse. Four cultivars each of S. officinarum, S. robustum and S. spontaneum along with two cutlivars representing S. sinense were selected to represent the spectrum of the genus Saccharum. Five synthetic growth regulators and a control were used as treatments. Beginning two weeks after planting, shoot number and shoot height measurements were taken every two weeks, for a period of eight weeks. From these data, increases in shoot production and growth rate were calculated and compared by analysis of variance. Protected LSD tests were employed to compare treatment effects.

Plants treated with (2-chloroethyl) phosphonic acid (ethephon) produced the highest number of shoots and showed increased growth rate. The (2-chloroethyl) trimethylammonium chloride (chlormequat) and poly [oxyethylene(dimethyliminio) ethylene (dimethyliminio) ethylene-dichloride] (bualta) treatments resulted in an increase in shoot production with no effect on plant vigor. Alpha-napthaleneacetic acid (NAA) and 2,4-dichlorophenoxyacetic acid (2,4-D) increased shoot number but plant vigor was decreased. Certain combinations of S. spontaneum or S. sinense cultivars with ethephon, chlormequat or bualta, resulted in an increase in shoot number over the control, with no effect on plant vigor.

A genetic study was also conducted to determine if the characteristic of response to ethephon by progenies of cultivars of S. spontaneum and CP65-357 crosses was under genetic control. Total shoot number and growth rate were increased in the parental cultivars and their progenies through the use of ethephon as a tillering agent. Unfortunately, differences in response of the half-sib families and their respective parents were not detected in the genetic study. However, the rather large differences in shoot number and growth rate among genotypes in response to ethephon in both plant and ratoon cane evaluated suggest that this characteristic of response is under genetic control.

Because this study was conducted under greenhouse environment, these results may not be applicable under field conditions. Further research is needed to determine whether or not the results reported herein could be repeated under field conditions.

1/ The research was partially funded by a grant from the American Sugar Cane League.

# Sucrose Lab Activities - 1986 Harvest Season

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During the 1986 harvest season, a total of 5,682 samples were processed at the St. Gabriel Sucrose Laboratory. Of this total, there were 5,594 sugarcane samples and 88 sorghum samples. In order to determine percent fiber, 128 sugarcane samples were run by the press analysis. The remainder were run through the roller mill by the St. Gabriel sucrose laboratory.

An IBM Personal Computer system was used in our laboratory analysis work in 1986. This system was designed to have the automatic Sacharimeter and the Refractometer linked to the computer. When a sample is run through these two instruments the number value of that sample is displayed on the computer terminal stored in memory and printed. At the end of a specific batch of samples, the computer saves all the data on a diskette and prints all the data in table-form for the user. This system has greatly improved the efficiency of the laboratory, thus allowing lab personnel to process more samples quickly and easily.

Table 1 presents a breakdown of the number of sugarcane and sorghum samples processed for each specific department.

Table 1. Number of sugarcane and sorghum samples processed at the St. Gabriel Sucrose Laboratory during the 1986 harvest season.

| Project | Number of samples | |
|---|---|---|
| | Sugarcane | Sorghum |
| Cooperative Extension | 22 | - |
| Plant Pathology | 88 | - |
| Weed Science | 148 | - |
| Entomology | 300 | 88 |
| Agronomy Cultural Practices and Fertility | 469 | - |
| Genetic Studies - Variety Development and testing | 3251 | - |
| Variety Development | | |
| Selection | 839 | - |
| Infield | 477 | - |
| Total | 5594 | 88 |

# Photoperiod and Crossing for the Year 1986

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One hundred sixty-seven varieties of sugarcane were used in the 1986 crossing campaign. There were 35 "L" varieties, 46 "LCP" varieties, 77 "CP" varieties selected for Louisiana, 8 "CP" varieties selected for Florida, and 1 "US" variety. Sixty-seven varieties were of unknown photoperiod response.

The 67 varieties of unknown photoperiod response along with 13 selected varieties of known response were placed on the greenhouse rail system for natural induction. By comparing the date of flowering of these newer varieties to the date of flowering of the older varieties, a first approximation of the photoperiod response of the new varieties can be made. The pollen producing capacity of each new variety that flowers following natural induction was also estimated. All experimental crosses produced with these new varieties are available to the variety selection phase of the program.

A photoperiod experiment begun in 1985 was repeated in 1986. Fourteen varieties of known photoperiod response were subjected to nine photoperiod regimes. Three of the six available photoperiod bays were used for the experiment and all carts in each bay contained identical material.

Sunlight was the sole light source for the 1986 photoperiod treatments. The doors of the photoperiod bays were opened at the prescribed time to start the photoperiod treatments and the carts were pulled from the photoperiod houses. The natural sunset terminated the photoperiod for each day. The carts were pushed into the photoperiod houses after sunset. From the hard to easy category in the experiment, the numbers of induction cycles (constant photoperiod) were 38, 23, and 9 days of 12 hours and 30 minutes. The constant photoperiod for each bay was programmed to be completed on July 12.

The decreasing of the photoperiod for the three bays commenced on July 12. Each bay received a different rate of declining daylength. The three rates were: a decrease of 1/2 minute per day, a decrease of 1 minute per day or a 30 day progressive rate of decrease after which the rate was held to 1 minute per day. On September 15, photoperiod treatments were stopped and the canes were again subjected to natural photoperiod. Data collected from the experiment consisted of date of tassel emergence, date tassel began to dehisce, and a pollen production rating.

The three remaining photoperiod bays were used exclusively for the production of true seed for the 1986 crossing campaign. Eighty-five varieties of known photoperiod response were placed on nine rail carts according to their ease of photoperiod flower induction. From the most difficult category to the easiest, the number of induction cycles (constant photoperiod) were 41, 38, 28, 23, 18, and 9 days of 12 hours and 30 minutes. The constant photoperiod for these bays was also programmed to be completed on July 12.

The decrease in photoperiod began on July 12. There was a progression in the rate of decrease until August 10, after which the rate was held at 1 minute per day until September 15. The canes were then subjected to natural photoperiod. All plants designated for pollen production were protected when night temperatures fell below 70 degrees Farenheit.

All stalks on the photoperiod system were air layered during the week of August 25. The first cross was made on September 23. The synchronization of tasseling was excellent and for all practical purposes, flowering on the photoperiod carts was completed by late October.

The first cross from the greenhouse rail system was made on November 25 and flowering of the material on this system continued into the month of January. At the end of the crossing campaign, all varieties that had not flowered were observed to determine if induction had taken place.

Two hundred seventy-four crosses were made with the material induced to flower via the controlled photoperiod. Eighty-eight crosses were made with the material from the greenhouse rail system. Tables 1 and 2 give a summary of the 1986 crossing campaign. Table 3 shows the flowering response to artificial photoperiod of the varieties used in the 1986 crossing campaign.

Unusually warm night temperatures during the crossing season resulted in heavy pollen production from varieties usually used as males in crossing. Many varieties normally considered to be females by previous crossing experience produced pollen and were used as males in the 1986 crossing campaign. As a result of the heavier pollen production, more polycrosses than usual were made in 1986.

Table 1. Summary of the 1986 crossing campaign.

| Type of cross | No. of crosses | No. of seedlings |
|---|---|---|
| Biparental | 239 | 308,575 |
| Polycross | 55 | 87,261 |
| Self | 68 | 26,991 |
| Total | 362 | 422,827 |

Table 2. Summary of crosses made in the LSU crossing program in 1986.

| Female Parent | # of Tassles | Male Parent | # of Tassles | Frequency of Cross | Estimated # of Viable Seed |
|---|---|---|---|---|---|
| CP48-103 | 2 | CP80-323 | 5 | 1 | 2304 |
| CP48-103 | 1 | LCP81-030 | 7 | 1 | 1386 |
| CP48-103 | 2 | L83-194 | 6 | 1 | 5264 |
| CP48-103 | 1 | SELF | . | 1 | 1379 |
| CP52-068 | 3 | CP80-356 | 13 | 2 | 1007 |
| CP52-068 | 2 | LCP81-030 | 10 | 2 | 2252 |
| CP52-068 | 1 | SELF | . | 1 | 31 |
| CP55-038 | 1 | SELF | . | 1 | 133 |
| CP57-614 | 1 | SELF | . | 1 | 690 |
| CP57-614 | 3 | 86P7 | . | 1 | 177 |
| CP61-037 | 1 | CP66-346 | 1 | 1 | 90 |
| CP61-037 | 2 | CP69-1052 | 5 | 1 | 738 |
| CP61-037 | 2 | CP70-321 | 9 | 1 | 598 |
| CP61-037 | 2 | CP72-355 | 2 | 1 | 31 |
| CP61-037 | 2 | CP73-351 | 2 | 1 | 928 |
| CP61-037 | 2 | CP77-310 | 2 | 1 | 1708 |
| CP61-037 | 1 | CP78-317 | 1 | 1 | 28 |
| CP61-037 | 2 | CP80-323 | 2 | 1 | 79 |
| CP61-037 | 1 | CP80-356 | 5 | 1 | 0 |
| CP61-037 | 1 | CP82-520 | 1 | 1 | 1284 |
| CP61-037 | 1 | LCP82-047 | 3 | 1 | 669 |
| CP61-037 | 2 | LCP82-089 | 6 | 1 | 692 |
| CP61-037 | 1 | LCP84-239 | 3 | 1 | 773 |
| CP61-037 | 1 | LCP84-282 | 1 | 1 | 8 |
| CP61-037 | 1 | L84-245 | 3 | 1 | 20 |
| CP62-258 | 1 | SELF | . | 1 | 326 |
| CP65-357 | 2 | CP48-103 | 2 | 1 | 2857 |
| CP65-357 | 2 | CP57-614 | 6 | 1 | 5712 |
| CP65-357 | 3 | CP70-321 | 9 | 1 | 74 |
| CP65-357 | 1 | CP72-1312 | 6 | 1 | 280 |
| CP65-357 | 1 | CP72-355 | 2 | 1 | 0 |
| CP65-357 | 1 | CP76-331 | 1 | 1 | 979 |
| CP65-357 | 3 | CP80-323 | 14 | 2 | 4907 |
| CP65-357 | 2 | CP80-356 | 6 | 1 | 0 |
| CP65-357 | 1 | CP81-325 | 1 | 1 | 345 |
| CP65-357 | 1 | CP83-657 | 4 | 1 | 944 |
| CP65-357 | 7 | LCP81-030 | 26 | 4 | 11101 |
| CP65-357 | 1 | LCP82-089 | 6 | 1 | 4631 |
| CP65-357 | 1 | L78-063 | 8 | 1 | 3123 |
| CP65-357 | 2 | L83-194 | 6 | 1 | 4250 |
| CP65-357 | 1 | L84-280 | 1 | 1 | 10 |
| CP65-357 | 2 | L84-290 | 2 | 1 | 5058 |
| CP66-346 | 1 | SELF | . | 1 | 395 |
| CP69-1052 | 1 | SELF | . | 1 | 683 |
| CP69-373 | 1 | L84-275 | 2 | 1 | 17 |
| CP69-373 | 1 | SELF | . | 1 | 14 |
| CP69-373 | 1 | 86P3 | . | 1 | 304 |

Table 2. Continued

| Female Parent | # of Tassles | Male Parent | # of Tassles | Frequency of Cross | Estimated # of Viable Seed |
|---|---|---|---|---|---|
| CP70-300 | 1 | CP70-321 | 8 | 1 | 15 |
| CP70-300 | 2 | CP72-355 | 6 | 2 | 443 |
| CP70-300 | 2 | CP72-370 | 7 | 1 | 1818 |
| CP70-300 | 2 | LCP81-030 | 5 | 2 | 3118 |
| CP70-321 | 2 | CP75-1091 | 3 | 1 | 0 |
| CP70-321 | 1 | LCP83-135 | 3 | 1 | 101 |
| CP70-321 | 1 | L83-194 | 6 | 1 | 262 |
| CP70-321 | 1 | SELF | . | 1 | 0 |
| CP70-321 | 2 | 86P2 | . | 1 | 530 |
| CP70-321 | 1 | 86P5 | . | 1 | 1134 |
| CP70-330 | 2 | CP72-355 | 6 | 2 | 1632 |
| CP70-330 | 2 | CP73-351 | 7 | 1 | 1462 |
| CP70-330 | 2 | CP74-383 | 13 | 2 | 1926 |
| CP70-330 | 2 | CP75-1091 | 4 | 1 | 456 |
| CP70-330 | 1 | CP77-410 | 3 | 1 | 298 |
| CP70-330 | 1 | CP80-313 | 4 | 1 | 499 |
| CP70-330 | 1 | LCP82-058 | 3 | 1 | 2635 |
| CP70-330 | 1 | LCP82-089 | 7 | 1 | 540 |
| CP70-330 | 2 | LCP83-158 | 3 | 1 | 2208 |
| CP70-330 | 1 | L77-038 | 6 | 1 | 1771 |
| CP70-330 | 1 | SELF | . | 1 | 0 |
| CP71-441 | 1 | CP70-330 | 7 | 1 | 184 |
| CP71-459 | 2 | 86P3 | . | 1 | 5085 |
| CP72-1210 | 1 | CP73-340 | 1 | 1 | 50 |
| CP72-1210 | 1 | CP74-383 | 5 | 1 | 339 |
| CP72-1210 | 3 | 86P3 | . | 1 | 2381 |
| CP72-1312 | 2 | LCP82-046 | 5 | 1 | 2064 |
| CP72-1312 | 1 | SELF | . | 1 | 437 |
| CP72-1312 | 2 | 86P3 | . | 1 | 3379 |
| CP72-1312 | 3 | 86P7 | . | 1 | 2160 |
| CP72-2086 | 1 | SELF | . | 1 | 456 |
| CP72-355 | 1 | SELF | . | 1 | 388 |
| CP72-355 | 2 | 86P1 | . | 1 | 4752 |
| CP72-355 | 3 | 86P2 | . | 1 | 3089 |
| CP72-355 | 1 | 86P3 | . | 1 | 1134 |
| CP72-355 | 1 | 86P4 | . | 1 | 1197 |
| CP72-370 | 2 | LCP81-030 | 7 | 1 | 200 |
| CP72-370 | 1 | SELF | . | 1 | 205 |
| CP73-340 | 1 | CP57-614 | 3 | 1 | 3584 |
| CP73-340 | 1 | SELF | . | 1 | 41 |
| CP73-340 | 3 | 86P1 | . | 1 | 3341 |
| CP73-343 | 1 | SELF | . | 1 | 97 |
| CP73-345 | 1 | CP74-383 | 8 | 1 | 18 |
| CP73-345 | 1 | CP77-407 | 2 | 1 | 1305 |
| CP73-345 | 1 | 86P4 | . | 1 | 166 |
| CP73-351 | 1 | SELF | . | 1 | 0 |
| CP73-351 | 1 | 86P5 | . | 1 | 882 |

Table 2. Continued

| Female Parent | # of Tassles | Male Parent | # of Tassles | Frequency of Cross | Estimated # of Viable Seed |
|---|---|---|---|---|---|
| CP74-1094 | 1 | LCP82-089 | 7 | 1 | 159 |
| CP74-1094 | 1 | SELF | . | 1 | 384 |
| CP74-2013 | 1 | SELF | . | 1 | . |
| CP74-328 | 2 | CP73-351 | 6 | 1 | 612 |
| CP74-328 | 2 | LCP81-030 | 10 | 2 | 1056 |
| CP74-328 | 1 | SELF | . | 1 | 151 |
| CP74-328 | 1 | 86P4 | . | 1 | 854 |
| CP74-383 | 1 | CP74-2013 | 3 | 1 | 743 |
| CP74-383 | 1 | CP74-328 | 2 | 1 | 479 |
| CP74-383 | 2 | CP76-331 | 8 | 1 | 2482 |
| CP74-383 | 2 | LCP81-030 | 10 | 2 | 1639 |
| CP74-383 | 2 | L83-194 | 6 | 1 | 2875 |
| CP74-383 | 1 | SELF | . | 1 | 298 |
| CP75-1082 | 1 | SELF | . | 1 | 1638 |
| CP75-1091 | 1 | SELF | . | 1 | 396 |
| CP75-1091 | 1 | 86P2 | . | 1 | 1230 |
| CP75-327 | 2 | CP70-321 | 6 | 1 | 252 |
| CP75-327 | 2 | CP72-355 | 5 | 1 | 51 |
| CP75-327 | 1 | CP72-370 | 7 | 1 | 258 |
| CP75-327 | 1 | CP73-351 | 7 | 1 | 409 |
| CP75-361 | 2 | LCP81-030 | 3 | 1 | 6019 |
| CP76-331 | 1 | SELF | 4 | 1 | 1310 |
| CP76-331 | 1 | 86P3 | . | 1 | 783 |
| CP77-310 | 1 | SELF | 4 | 1 | 1478 |
| CP77-402 | 1 | SELF | . | 1 | 1337 |
| CP77-405 | 1 | CP55-038 | 2 | 1 | 737 |
| CP77-405 | 1 | CP80-323 | 8 | 1 | 1858 |
| CP77-405 | 1 | 86P1 | . | 1 | 2318 |
| CP77-405 | 1 | 86P3 | . | 1 | 1499 |
| CP77-405 | 1 | 86P4 | . | 1 | 1802 |
| CP77-407 | 1 | CP72-370 | 7 | 1 | 12 |
| CP77-407 | 1 | SELF | . | 1 | 295 |
| CP77-407 | 1 | 86P4 | . | 1 | 1728 |
| CP77-410 | 1 | SELF | . | 1 | 177 |
| CP77-414 | 2 | CP74-1094 | 1 | 1 | 1340 |
| CP78-317 | 2 | CP72-355 | 6 | 2 | 1037 |
| CP78-317 | 2 | CP73-343 | 8 | 1 | 3127 |
| CP78-317 | 3 | CP76-331 | 10 | 3 | 1975 |
| CP78-317 | 2 | CP77-410 | 3 | 1 | 364 |
| CP78-317 | 1 | CP78-357 | 3 | 1 | 711 |
| CP78-317 | 2 | LCP81-030 | 3 | 1 | 2268 |
| CP78-317 | 1 | L75-056 | 8 | 1 | 304 |
| CP78-317 | 1 | SELF | . | 1 | 0 |
| CP78-357 | 1 | CP57-614 | 3 | 1 | 190 |
| CP78-357 | 1 | CP70-321 | 3 | 1 | 332 |
| CP78-357 | 1 | SELF | . | 1 | 350 |
| CP78-357 | 1 | 86P3 | . | 1 | 599 |

Table 2. Continued

| Female Parent | # of Tassles | Male Parent | # of Tassles | Frequency of Cross | Estimated # of Viable Seed |
|---|---|---|---|---|---|
| CP79-318 | 2 | CP62-258 | 3 | 1 | 6768 |
| CP79-318 | 2 | CP66-346 | 5 | 1 | 2366 |
| CP79-318 | 2 | CP72-355 | 6 | 2 | 5818 |
| CP79-318 | 1 | CP74-2013 | 3 | 1 | 4787 |
| CP79-318 | 1 | CP75-1082 | 2 | 1 | 3375 |
| CP79-318 | 2 | CP80-356 | 7 | 1 | 52 |
| CP79-318 | 1 | LCP82-089 | 6 | 1 | 2293 |
| CP79-318 | 1 | LCP83-126 | 2 | 1 | 2894 |
| CP79-318 | 1 | 86P4 | . | 1 | 2189 |
| CP79-332 | 1 | CP72-370 | 2 | 1 | 34 |
| CP79-332 | 1 | CP73-343 | 8 | 1 | 4914 |
| CP79-332 | 1 | CP74-383 | 5 | 1 | 510 |
| CP79-332 | 2 | CP75-1082 | 2 | 1 | 4104 |
| CP79-332 | 3 | CP76-331 | 10 | 3 | 7119 |
| CP79-332 | 2 | LCP81-030 | 3 | 1 | 7260 |
| CP79-332 | 1 | LCP82-089 | 6 | 1 | 1408 |
| CP79-332 | 2 | L78-063 | 8 | 1 | 5325 |
| CP79-348 | 1 | LCP81-030 | 4 | 1 | 1064 |
| CP79-348 | 2 | L75-056 | 8 | 1 | 591 |
| CP80-313 | 1 | CP72-2086 | 1 | 1 | 140 |
| CP80-313 | 1 | CP74-328 | 2 | 1 | 286 |
| CP80-313 | 5 | CP76-331 | 10 | 2 | 5097 |
| CP80-313 | 2 | CP80-323 | 6 | 1 | 700 |
| CP80-313 | 2 | CP80-356 | 5 | 1 | 137 |
| CP80-313 | 1 | LCP81-030 | 6 | 1 | 655 |
| CP80-313 | 1 | L77-038 | 6 | 1 | 1238 |
| CP80-313 | 1 | SELF | . | 1 | 32 |
| CP80-313 | 2 | 86P1 | . | 1 | 2218 |
| CP80-313 | 2 | 86P2 | . | 1 | 1879 |
| CP80-313 | 1 | 86P3 | . | 1 | 592 |
| CP80-313 | 1 | 86P4 | . | 1 | 920 |
| CP80-313 | 1 | 86P5 | . | 1 | 2944 |
| CP80-323 | 1 | SELF | . | 1 | 680 |
| CP80-356 | 1 | CP69-373 | 1 | 1 | 19 |
| CP80-356 | 3 | CP72-355 | 8 | 2 | 4851 |
| CP80-356 | 2 | CP77-402 | 4 | 1 | 5888 |
| CP80-356 | 1 | SELF | . | 1 | 174 |
| CP81-325 | 2 | CP72-355 | 5 | 1 | 1865 |
| CP81-325 | 1 | SELF | . | 1 | 138 |
| CP81-329 | 1 | CP73-351 | 7 | 1 | 3270 |
| CP81-329 | 1 | 86P3 | . | 1 | 4957 |
| CP81-332 | 1 | CP57-614 | 3 | 1 | 2782 |
| CP81-332 | 3 | CP76-331 | 11 | 3 | 4651 |
| CP81-332 | 1 | CP80-323 | 8 | 1 | 630 |
| CP81-332 | 3 | LCP83-133 | 2 | 1 | 4963 |
| CP82-512 | 2 | L84-229 | 2 | 1 | 516 |
| CP82-513 | 2 | CP72-355 | 6 | 2 | 404 |

Table 2. Continued

| Female Parent | # of Tassles | Male Parent | # of Tassles | Frequency of Cross | Estimated # of Viable Seed |
|---|---|---|---|---|---|
| CP82-513 | 2 | CP80-356 | 6 | 1 | 44 |
| CP82-513 | 2 | LCP81-030 | 10 | 2 | 2098 |
| CP82-519 | 1 | 86P6 | . | 1 | 1352 |
| CP82-520 | 1 | L84-268 | 2 | 1 | 72 |
| CP82-520 | 1 | SELF | . | 1 | 21 |
| CP82-527 | 1 | CP70-321 | 6 | 1 | 238 |
| CP82-527 | 2 | CP80-323 | 8 | 1 | 3387 |
| CP82-537 | 1 | CP76-331 | 8 | 1 | 1262 |
| CP82-537 | 1 | 86P4 | . | 1 | 1329 |
| CP82-541 | 1 | SELF | . | 1 | 0 |
| CP82-547 | 1 | CP83-646 | 1 | 1 | 0 |
| CP82-550 | 2 | CP82-541 | 3 | 1 | 104 |
| CP82-552 | 1 | CP72-1312 | 6 | 1 | 748 |
| CP82-559 | 1 | CP80-323 | 8 | 1 | 1193 |
| CP83-606 | 2 | CP57-614 | 6 | 1 | 613 |
| CP83-606 | 2 | LCP84-274 | 2 | 1 | 0 |
| CP83-607 | 1 | CP74-383 | 8 | 1 | 208 |
| CP83-626 | 1 | CP82-520 | 1 | 1 | 882 |
| CP83-626 | 1 | 86P6 | . | 1 | 2100 |
| CP83-628 | 2 | CP72-370 | 2 | 1 | 187 |
| CP83-628 | 1 | L84-261 | 3 | 1 | 930 |
| CP83-628 | 1 | L84-290 | 2 | 1 | 540 |
| CP83-634 | 1 | L84-290 | 2 | 1 | 3740 |
| CP83-644 | 1 | L84-261 | 3 | 1 | 2090 |
| CP83-646 | 2 | SELF | . | 1 | 296 |
| CP83-656 | 1 | SELF | . | 1 | 20 |
| CP83-657 | 1 | SELF | . | 1 | 0 |
| CP83-670 | 2 | CP52-068 | 8 | 1 | 132 |
| LCP81-010 | 2 | CP72-355 | 6 | 2 | 1618 |
| LCP81-010 | 1 | CP74-2013 | 3 | 1 | 1478 |
| LCP81-010 | 3 | CP76-331 | 10 | 3 | 4961 |
| LCP81-010 | 1 | CP81-325 | 1 | 1 | 120 |
| LCP81-010 | 2 | LCP81-030 | 10 | 2 | 3741 |
| LCP81-010 | 1 | LCP82-089 | 6 | 1 | 1613 |
| LCP81-010 | 2 | L75-056 | 8 | 1 | 1646 |
| LCP81-030 | 1 | SELF | . | 1 | 410 |
| LCP81-030 | 1 | 86P3 | . | 1 | 2856 |
| LCP82-046 | 2 | LCP81-030 | 3 | 1 | 5837 |
| LCP82-046 | 1 | SELF | . | 1 | 111 |
| LCP82-047 | 1 | CP70-321 | 8 | 1 | 101 |
| LCP82-047 | 1 | SELF | . | 1 | 3773 |
| LCP82-058 | 2 | CP69-1052 | 5 | 1 | 561 |
| LCP82-058 | 2 | CP80-323 | 6 | 1 | 605 |
| LCP82-058 | 1 | SELF | . | 1 | 21 |
| LCP82-089 | 1 | SELF | . | 1 | 21 |
| LCP82-089 | 1 | 86P5 | . | 1 | 3232 |
| LCP82-094 | 1 | CP76-331 | 8 | 1 | 882 |

Table 2. Continued

| Female Parent | # of Tassles | Male Parent | # of Tassles | Frequency of Cross | Estimated # of Viable Seed |
|---|---|---|---|---|---|
| LCP82-094 | 3 | LCP81-030 | 7 | 2 | 2895 |
| LCP82-094 | 1 | LCP83-158 | 3 | 1 | 458 |
| LCP82-094 | 1 | L78-063 | 8 | 1 | 777 |
| LCP82-094 | 1 | 86P4 | . | 1 | 527 |
| LCP83-119 | 2 | LCP81-030 | 7 | 1 | 3708 |
| LCP83-119 | 1 | 86P1 | . | 1 | 738 |
| LCP83-123 | 1 | CP57-614 | 3 | 1 | 28 |
| LCP83-123 | 2 | CP72-355 | 6 | 2 | 59 |
| LCP83-123 | 1 | CP76-331 | 8 | 1 | 126 |
| LCP83-123 | 1 | CP77-310 | 1 | 1 | 31 |
| LCP83-126 | 1 | SELF | . | 1 | 2208 |
| LCP83-133 | 1 | CP77-310 | 1 | 1 | 354 |
| LCP83-133 | 1 | SELF | . | 1 | 248 |
| LCP83-133 | 1 | 86P2 | . | 1 | 28 |
| LCP83-135 | 2 | LCP81-030 | 7 | 1 | 2243 |
| LCP83-135 | 1 | SELF | . | 1 | 983 |
| LCP83-140 | 1 | CP76-331 | . | 1 | 1501 |
| LCP83-140 | 1 | CP77-402 | 4 | 1 | 941 |
| LCP83-140 | 2 | LCP81-030 | 8 | 1 | 128 |
| LCP83-146 | 1 | CP70-321 | 8 | 1 | 144 |
| LCP83-146 | 2 | LCP81-030 | 7 | 1 | 2440 |
| LCP83-154 | 1 | CP70-330 | 7 | 1 | 22 |
| LCP83-154 | 2 | LCP81-030 | 10 | 2 | 738 |
| LCP83-154 | 1 | 86P4 | . | 1 | 366 |
| LCP83-158 | 1 | SELF | . | 1 | 302 |
| LCP83-165 | 2 | CP72-355 | 3 | 1 | 375 |
| LCP83-165 | 2 | CP76-331 | 3 | 1 | 1918 |
| LCP83-165 | 2 | LCP81-030 | 4 | 1 | 1186 |
| LCP83-165 | 2 | LCP83-135 | 3 | 1 | 1766 |
| LCP83-169 | 1 | CP55-038 | 2 | 1 | 277 |
| LCP83-179 | 1 | CP70-321 | 9 | 1 | 27 |
| LCP83-179 | 1 | CP73-340 | 1 | 1 | 11 |
| LCP83-179 | 1 | CP77-310 | 1 | 1 | 45 |
| LCP83-179 | 1 | CP80-323 | 6 | 1 | 10 |
| LCP83-179 | 1 | CP80-356 | 5 | 1 | 403 |
| LCP83-179 | 1 | LCP81-030 | 6 | 1 | 855 |
| LCP83-179 | 1 | LCP82-089 | 7 | 1 | 207 |
| LCP83-179 | 1 | LCP84-212 | 4 | 1 | 7 |
| LCP83-189 | 1 | CP70-321 | 8 | 1 | 24 |
| LCP83-189 | 1 | CP70-330 | 7 | 1 | 241 |
| LCP83-189 | 2 | LCP81-030 | 5 | 2 | 385 |
| LCP84-200 | 2 | 86P6 | . | 1 | 79 |
| LCP84-211 | 1 | SELF | . | 1 | 0 |
| LCP84-211 | 1 | 86P6 | . | 1 | 61 |
| LCP84-212 | 1 | SELF | . | 1 | 0 |
| LCP84-222 | 1 | 86P6 | . | 1 | 1954 |
| LCP84-239 | 1 | SELF | . | 1 | 32 |

Table 2. Continued

| Female Parent | # of Tassles | Male Parent | # of Tassles | Frequency of Cross | Estimated # of Viable Seed |
|---|---|---|---|---|---|
| LCP84-257 | 1 | 86P6 | . | 1 | 143 |
| LCP84-260 | 1 | LCP84-211 | 1 | 1 | 108 |
| LCP84-274 | 1 | SELF | . | 1 | 0 |
| LCP84-282 | 1 | SELF | . | 1 | 0 |
| LCP86-391 | 2 | L78-063 | 8 | 1 | 2111 |
| LCP86-391 | 2 | L83-194 | 6 | 1 | 2680 |
| L75-056 | 1 | SELF | . | 1 | 22 |
| L77-038 | 1 | SELF | . | 1 | 500 |
| L78-063 | 1 | SELF | . | 1 | 1612 |
| L78-063 | 1 | 86P4 | . | 1 | 6160 |
| L79-012 | 1 | CP73-351 | 7 | 1 | 2227 |
| L83-193 | 2 | CP80-356 | 7 | 1 | 412 |
| L83-193 | 1 | LCP81-030 | 3 | 1 | 1548 |
| L83-194 | 1 | CP57-614 | 3 | 1 | 1326 |
| L83-194 | 1 | CP73-351 | 2 | 1 | 530 |
| L83-194 | 1 | SELF | . | 1 | 630 |
| L84-218 | 1 | CP74-383 | 8 | 1 | 2001 |
| L84-218 | 2 | L84-273 | 2 | 1 | 2106 |
| L84-224 | 2 | CP74-383 | 3 | 1 | 2525 |
| L84-224 | 1 | L84-273 | 2 | 1 | 464 |
| L84-229 | 1 | SELF | . | 1 | 56 |
| L84-229 | 1 | 86P6 | . | 1 | 302 |
| L84-238 | 1 | CP74-383 | 8 | 1 | 9 |
| L84-238 | 1 | L84-273 | 2 | 1 | 118 |
| L84-238 | 1 | L84-278 | 4 | 1 | 0 |
| L84-244 | 2 | CP83-646 | 1 | 1 | 358 |
| L84-244 | 2 | L84-262 | 2 | 1 | 3646 |
| L84-245 | 1 | SELF | . | 1 | 194 |
| L84-253 | 2 | 86P6 | . | 1 | 952 |
| L84-261 | 1 | SELF | . | 1 | 34 |
| L84-262 | 1 | SELF | . | 1 | 1140 |
| L84-263 | 3 | 86P7 | . | 1 | 5234 |
| L84-264 | 1 | 86P6 | . | 1 | 40 |
| L84-268 | 1 | SELF | . | 1 | 0 |
| L84-273 | 1 | SELF | . | 1 | 32 |
| L84-275 | 1 | SELF | . | 1 | 0 |
| L84-276 | 1 | CP83-656 | 2 | 1 | 0 |
| L84-278 | 1 | SELF | . | 1 | 55 |
| L84-280 | 1 | SELF | . | 1 | 0 |
| L84-288 | 1 | 86P6 | . | 1 | 3113 |
| L84-290 | 1 | SELF | . | 1 | 134 |
| TOTALS | 459 | | ---- | 355 | 423025 |

Polycrosses are designated 86P#.

Table 3. Photoperiodic ease of flowering of varieties used in the 1986 crossing campaign.

| Flowering class[1] | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| CP52-068 | CP48-103 | CP70-300 | CP61-037 | CP73-343 | CP82-527 | CP73-340 | CP82-537 | CP69-1052 |
| CP57-614 | CP62-258 | CP72-1210 | CP65-357 | CP74-1094 | LCP82-094 | CP73-351 | LCP83-126 | CP71-357 |
| CP71-459 | CP66-346 | CP72-1312 | CP70-321 | CP77-414 | LCP83-158 | CP79-332 | LCP83-146 | CP71-441 |
| CP74-2013 | CP69-373 | CP72-355 | CP70-330 | CP80-323 | LCP83-179 | CP82-513 | L79-012 | CP72-2086 |
| CP74-383 | CP74-328 | CP75-1082 | CP73-345 | LCP82-047 | LCP83-189 | LCP82-089 | L83-193 | CP72-370 |
| CP76-331 | CP75-1091 | CP77-407 | CP78-357 | LCP86-391 | | LCP83-140 | | CP79-300 |
| CP77-310 | CP75-327 | CP80-356 | CP79-318 | | | | | CP80-314 |
| CP77-410 | CP75-361 | CP81-325 | CP80-313 | | | | | CP81-304 |
| CP78-317 | CP77-402 | CP81-332 | LCP83-135 | | | | | CP81-329 |
| LCP81-010 | CP77-405 | CP82-559 | LCP83-154 | | | | | CP82-551 |
| LCP83-133 | CP79-348 | LCP83-119 | L77-038 | | | | | LCP82-053 |
| LCP83-165 | LCP81-030 | LCP83-123 | | | | | | LCP82-058 |
| | LCP82-046 | L78-063 | | | | | | LCP82-073 |
| | L75-056 | | | | | | | LCP83-122 |
| | L83-194 | | | | | | | LCP83-129 |
| | | | | | | | | LCP83-136 |
| | | | | | | | | LCP83-137 |
| | | | | | | | | LCP83-138 |
| | | | | | | | | LCP83-149 |
| | | | | | | | | LCP83-151 |
| | | | | | | | | LCP83-153 |
| | | | | | | | | LCP83-159 |
| | | | | | | | | LCP83-164 |
| | | | | | | | | LCP83-169 |
| | | | | | | | | L74-049 |
| | | | | | | | | L83-144 |
| | | | | | | | | US74-090 |

[1] Flowering class is based on number of days to first flower after photoperiod is initiated:

1 <90 days
2 90 to 94 days
3 95 to 99 days
4 100 to 104 days
5 105 to 109 days
6 110 to 114 days
7 115 to 119 days
8 120 to 124 days
9 >124 days

# Selections, Line Trials, and Assignments For The Year 1986

Keith Bischoff and F. A. Martin

A summary of selections, advancements and assignments made during 1986 by the Louisiana Sugarcane Variety Improvement Program is presented in Table 1. Eighty-four thousand seedlings representing 219 "L" crosses were potted and placed in the greenhouse in February, 1986. Sixty-three thousand four hundred eighty-eight seedlings were from the 1985 crossing series, the remaining 20,992 were from the 1983 crossing series. Of the seedlings set to the field in April, 74,866 survived the transplanting operation.

Of the 70,764 seedlings representing the 1984 and 1983 crossing series' planted as single stools in April, 1985, 54,000 overwintered and were available for selection in 1986. Four thousand seven hundred forty-three or 9% of the clones in the stubble single stool stage were selected and advanced to first line trial plots (6 foot plots). Those clones advanced, met or exceeded minimum standards for growth habit, stalk number, stalk diameter, stalk height, brix (by hand refractometer) and absence of pith and/or tube.

One thousand sixty-four (28%) of the 3,810 first line trial clones, or the 1983 crossing series, were advanced to second line trial (fifteen foot) plots. These advancements were based on agronomic ratings, degree of lodging and the absence of pith and/or tube as compared to commercial check plots planted throughout the field of line trials.

One thousand one hundred thirty-six clones of the 1982 crossing series in second line trial plant cane plots were rated and evaluated for agronomic traits. Based on these evaluations and the previous years' sucrose analysis, 320 clones were planted in fifteen foot increase plots and will be considered for assignment in 1987. Samples (six stalk) were taken from the second line trial plant cane and first line trial stubble plots of each of these clones. Mean stalk weights and sucrose data (via mill extraction) were obtained from these samples.

Two hundred nine clones of the 1981 crossing series in second line trial first stubble plots were considered for assignment in 1986. Based on agronomic ratings, stalk counts, and four years' sucrose analyses, 79 clones were assigned permanent '86 variety numbers. One clone was from the "L" breeding program, it was assigned an "L86" number; the remaining 78 clones were progenies of "CP" crosses that were selected in the "L" program and were assigned "LCP86" numbers. After assignment, a six stalk sample of each clone was analyzed for fiber via the chip-press method. The 1986 clones were planted in replicated single row nursery plots on both Commerce silt loam soil and Sharkey clay soil.

Table 1. Summary of selections, advancements and assignments made during 1986 by the Louisiana Sugarcane Variety Improvement Program.

| Crossing series | Number of crosses | Seedlings potted | Seedlings to field | Survived trans-planting | Available for selection | Advanced to First lines | Advanced to Second lines | Candidates for assignment | Assigned in 1985 |
|---|---|---|---|---|---|---|---|---|---|
| 81 | 150 | 76,766 | 68,756 | 62,803 | 48,628 | 5,029 | 938 | 209[2/] | 79[1/3/] |
| 82 | 99 | 76,928 | 66,651 | 45,714 | 25,357 | 3,397 | 1,136 | 320[1/3] | |
| 83 | 194 | 80,000 | 67,167 | 54,756 | 37,967 | 3,810[2/] | 1,064[3/] | | |
| 84 | 181 | 84,000 | 77,127 | 70,764 | 54,000 | 4,743[1/3/] | | | |
| 85 | 219 | 84,000 | 77,000 | 74,866[2/3/] | | | | | |

[1/] Work done in 1986.

[2/] Number of possible new varieties in field at the beginning of the 1986 season.

[3/] Number of possible new varieties following selection, line trial evaluation and assignment.

Summary of the data on the varieties assigned permanent "L" and "LCP" numbers in 1986

| Variety | Parents | S/A | S/T | T/A |
|---|---|---|---|---|
| CP61-037 | | 6412 | 201 | 33.7 |
| CP65-357 | | 7488 | 247 | 31.5 |
| CP70-321 | | 8008 | 244 | 33.4 |
| CP74-383 | | 6568 | 222 | 32.2 |
| LCP86-392 | CP78-317 x CP77-1446 | 6712 | 273 | 24.2 |
| LCP86-393 | CP65-357 x CP77-407 | 8424 | 245 | 34.9 |
| LCP86-394 | CP65-357 x CP77-407 | 7367 | 233 | 33.5 |
| LCP86-395 | CP75-361 x CP77-407 | 7817 | 246 | 32.8 |
| LCP86-396 | CP65-357 x CP77-407 | 7924 | 227 | 35.9 |
| LCP86-397 | CP77-418 x Misc. | 7095 | 228 | 30.5 |
| LCP86-398 | CP68-368 x CP74-387 | 7180 | 230 | 32.2 |
| LCP86-399 | CP74-387 x CP77-418 | 10316 | 245 | 46.1 |
| LCP86-400 | CP74-383 x CP70-330 | 8247 | 222 | 40.9 |
| LCP86-401 | CP75-361 x CP77-407 | 7511 | 221 | 37.8 |
| LCP86-402 | CP70-321 x CP73-340 | 8894 | 232 | 43.1 |
| LCP86-403 | CP76-340 x CP77-418 | 7600 | 226 | 34.9 |
| LCP86-404 | CP68-368 x CP77-418 | 7965 | 236 | 33.7 |
| LCP86-405 | CP76-340 x Misc. | 8361 | 231 | 37.2 |
| LCP86-406 | CP72-356 x CP66-346 | 7450 | 226 | 35.2 |
| LCP86-407 | CP78-344 x CP68-361 | 8386 | 239 | 36.7 |
| LCP86-408 | CP65-357 x CP77-407 | 9838 | 224 | 45.8 |
| LCP86-409 | CP75-361 x CP77-407 | 8503 | 265 | 33.2 |
| LCP86-410 | CP65-357 x CP77-407 | 8619 | 248 | 34.4 |
| LCP86-411 | CP65-357 x CP77-407 | 7219 | 257 | 28.1 |
| LCP86-412 | CP75-361 x CP77-407 | 8235 | 229 | 37.9 |
| LCP86-413 | CP70-321 x CP73-340 | 8331 | 242 | 34.3 |
| LCP86-414 | CP76-340 x CP77-418 | 7758 | 232 | 35.4 |
| LCP86-415 | CP72-356 x CP66-346 | 8489 | 219 | 42.0 |
| LCP86-416 | CP77-414 x CP74-387 | 9505 | 235 | 41.6 |
| LCP86-417 | CP74-383 x CP70-330 | 7237 | 236 | 32.0 |
| LCP86-418 | CP74-2013 x CP77-418 | 7816 | 225 | 36.5 |
| LCP86-419 | CP75-361 x CP77-310 | 8740 | 256 | 35.1 |
| LCP86-420 | CP70-330 x US78-026 | 7552 | 239 | 31.4 |
| LCP86-421 | CP77-415 x CP75-308 | 7319 | 230 | 31.6 |
| LCP86-422 | CP75-361 x CP77-310 | 9016 | 266 | 35.8 |
| LCP86-423 | CP75-361 x CP77-310 | 7582 | 229 | 39.6 |
| LCP86-424 | CP75-361 x CP77-310 | 9112 | 242 | 39.5 |
| LCP86-425 | CP76-330 x CP79-347 | 7222 | 240 | 31.8 |
| LCP86-426 | CP75-361 x CP77-310 | 8282 | 239 | 38.4 |
| LCP86-427 | CP75-361 x CP77-418 | 7859 | 214 | 40.2 |
| LCP86-428 | CP75-361 x CP77-310 | 8338 | 236 | 40.5 |
| LCP86-429 | CP74-2013 x CP77-418 | 8045 | 230 | 35.9 |
| LCP86-430 | CP75-361 x CP77-418 | 7598 | 225 | 37.0 |
| LCP86-431 | CP74-383 x CP66-346 | 8991 | 227 | 44.2 |
| LCP86-432 | CP75-361 x CP77-310 | 7965 | 235 | 36.8 |
| LCP86-433 | CP75-361 x CP77-418 | 9299 | 238 | 40.4 |
| LCP86-434 | CP75-361 x CP77-310 | 7189 | 237 | 31.8 |
| LCP86-435 | CP78-344 x CP77-418 | 8961 | 241 | 40.4 |

| Variety | Parents | S/A | S/T | T/A |
|---|---|---|---|---|
| LCP86-436 | US76-083 x L61-067 | 7314 | 232 | 33.7 |
| LCP86-437 | CP74-387 x L65-069 | 6879 | 232 | 32.3 |
| LCP86-438 | CP72-356 x L65-069 | 8334 | 226 | 42.3 |
| L86-439 | US77-009 x L65-069 | 7663 | 227 | 38.9 |
| LCP86-440 | CP75-361 x CP77-418 | 7304 | 227 | 34.8 |
| LCP86-441 | CP75-361 x CP77-310 | 7615 | 238 | 35.5 |
| LCP86-442 | CP76-330 x CP79-347 | 8640 | 221 | 42.7 |
| LCP86-443 | CP78-344 x CP77-418 | 7909 | 248 | 32.7 |
| LCP86-444 | CP78-344 x CP77-418 | 8863 | 231 | 38.7 |
| LCP86-445 | CP77-414 x CP74-387 | 7849 | 233 | 34.3 |
| LCP86-446 | CP75-361 x CP75-310 | 8509 | 221 | 43.7 |
| LCP86-447 | CP75-361 x CP77-310 | 7786 | 242 | 34.1 |
| LCP86-448 | CP78-344 x CP77-418 | 8249 | 236 | 36.4 |
| LCP86-449 | CP69-1059 x CP69-1052 | 7577 | 234 | 33.4 |
| LCP86-450 | CP75-361 x CP77-418 | 9068 | 238 | 41.6 |
| LCP86-451 | CP75-361 x CP77-310 | 10307 | 246 | 41.1 |
| LCP86-452 | CP75-361 x CP77-310 | 8700 | 249 | 37.4 |
| LCP86-453 | CP75-361 x CP77-310 | 8890 | 257 | 36.2 |
| LCP86-454 | CP77-310 x CP69-380 | 10502 | 250 | 42.5 |
| LCP86-455 | CP75-361 x CP77-418 | 8337 | 251 | 33.1 |
| LCP86-456 | CP75-361 x CP72-355 | 7401 | 254 | 31.2 |
| LCP86-457 | CP61-037 x CP78-304 | 9923 | 231 | 43.8 |
| LCP86-458 | CP75-361 x CP77-310 | 7937 | 228 | 37.5 |
| LCP86-459 | CP78-344 x CP77-418 | 8855 | 233 | 44.0 |
| LCP86-460 | CP75-361 x CP77-418 | 7523 | 242 | 33.6 |
| LCP86-461 | CP73-308 x CP78-355 | 9297 | 234 | 41.8 |
| LCP86-462 | CP75-361 x CP77-413 | 9612 | 230 | 44.9 |
| LCP86-463 | CP75-361 x CP77-418 | 8671 | 235 | 37.4 |
| LCP86-464 | CP73-308 x CP78-355 | 9217 | 241 | 38.7 |
| LCP86-465 | CP65-357 x L65-069 | 7782 | 223 | 39.0 |
| LCP86-466 | CP73-308 x CP78-355 | 7060 | 247 | 30.8 |
| LCP86-467 | Mer60-010 x CP52-048 | 6915 | 230 | 31.9 |
| LCP86-468 | CP72-355 x CP77-414 | 8302 | 255 | 35.3 |
| LCP86-469 | CP75-308 x CP78-304 | 7933 | 232 | 34.9 |
| LCP86-470 | CP77-310 x CP77-418 | 6949 | 246 | 30.8 |

# RESULTS FROM THE 1986 INFIELD VARIETY TRIALS AT ST.GABRIEL

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In the Louisiana sugarcane variety development program, varieties are planted in infield variety trials from the time they are assigned a permanent number until they are planted in outfield variety trials. At the St. Gabriel Research Station, infield variety trials are planted on two soil types: Commerce silt loam soil and Sharkey clay soil.

The weather during the growing season was very favorable for cane growth, resulting in a heavy crop. A mild winter at the beginning of the year allowed the crop to get a good start. However, because of the rainy harvest season, several of the trials were harvested in muddy conditions. Information on the St. Gabriel area weather conditions for 1986 can be found in Table 1 and Figure 1.

At the beginning of spring, 2,4-D was applied to remove winter weeds. Later, after rows were off-barred, a pre-emergence herbicide was applied. Nitrogen and potash were incorporated into the soil in late April. Fields were laid-by in June and another pre-emergence herbicide was applied. In 1986, one application of insecticide was needed late in the season for the control of the sugarcane borer.

Seven infield trials were planted in 1986. The specifics of each test planted are presented in Table 2. These trials included varieties from the 1983 assignment series through the 1986 assignment series. Three commercial varieties (CP 65-357, CP 70-321, and CP 74-383) were planted as standards in each test.

Seventeen infield variety trials were harvested at St. Gabriel in 1986. At least three commercial varieties (CP 65-357, CP 70-321, and CP 74-383) were included as standards in each trial. Except for the second stubble trials of the 1981 and 1982 assignment series, trials were cut with a mechanical harvester. During the 1986 harvest, the percentage of stalks broken during harvesting were estimated in five infield trials. This was done by pulling 50 stalks from each plot after the trial was cut by a mechanical harvester. The number of stalks damaged during the harvesting procedure was determined from each 50-stalk sample. Plots were then weighed with a tractor-mounted hydraulic weigh rig. For all trials, a ten stalk sample was pulled from each plot and sent to the St. Gabriel sucrose lab for analysis. Analyses were done to determine varietal differences. The results of these trials can be found in Tables 3 through 19.

Figure 1: Climatic data for St. Gabriel, LA for 1986

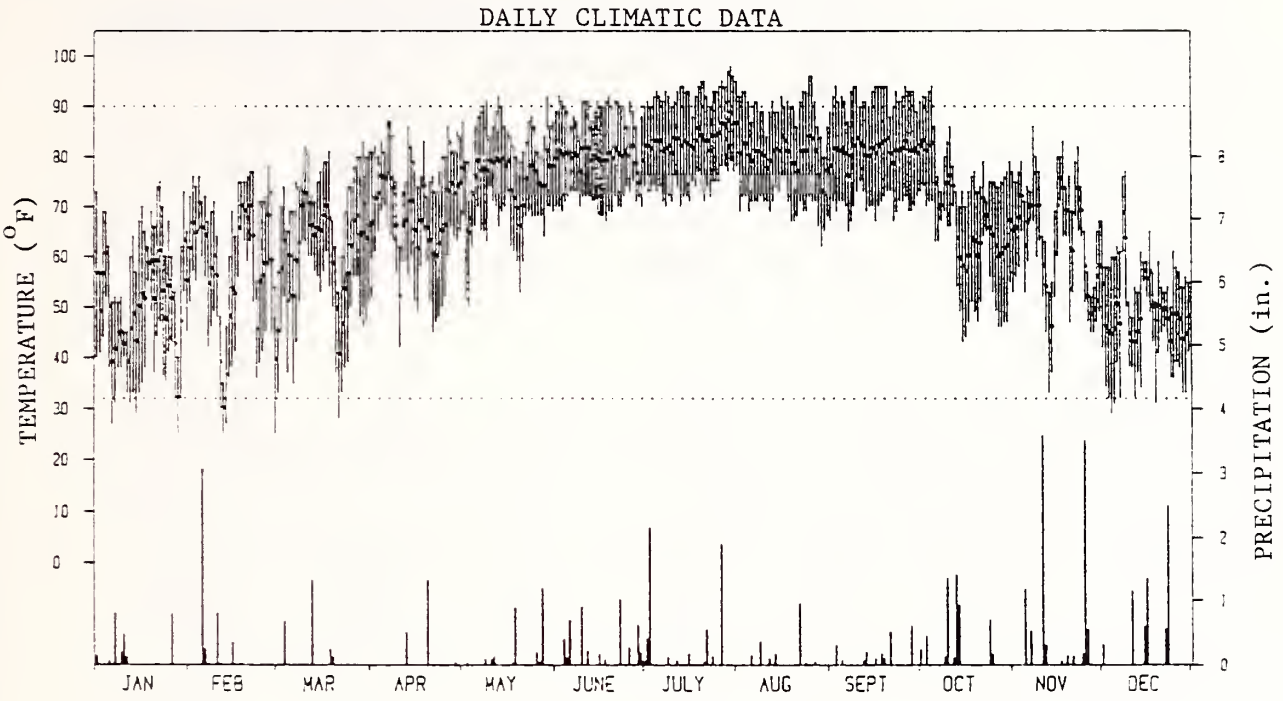


Table 1: Summary of the 1986 climatic data for St. Gabriel, LA.

TEMPERATURE (°F):

| MON | AVG MAX | AVG MIN | ABS MAX | ABS MIN | AVG TEMP | GDD 50 | GDD 60 | DAYS >90 | DAYS <32 | HDD | CDD |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JAN | 61.5 | 38.5 | 75 | 24 | 50.0 | 93 | 5 | 0 | 5 | 466 | 0 |
| FEB | 68.2 | 48.1 | 78 | 25 | 58.1 | 279 | 87 | 0 | 3 | 220 | 28 |
| MAR | 71.3 | 47.9 | 83 | 25 | 60.1 | 342 | 114 | 0 | 2 | 188 | 35 |
| APR | 79.3 | 57.4 | 87 | 42 | 68.4 | 551 | 259 | 0 | 0 | 31 | 131 |
| MAY | 85.2 | 65.3 | 92 | 50 | 75.3 | 783 | 473 | 3 | 0 | 1 | 319 |
| JUN | 88.9 | 70.9 | 92 | 67 | 79.9 | 897 | 597 | 11 | 0 | 0 | 447 |
| JUL | 92.6 | 73.6 | 98 | 70 | 83.1 | 1027 | 717 | 25 | 0 | 0 | 562 |
| AUG | 90.3 | 70.7 | 96 | 62 | 80.5 | 945 | 635 | 17 | 0 | 0 | 480 |
| SEP | 91.8 | 70.1 | 94 | 65 | 81.0 | 929 | 629 | 23 | 0 | 0 | 479 |
| OCT | 79.0 | 58.2 | 94 | 43 | 68.6 | 576 | 272 | 5 | 0 | 58 | 169 |
| NOV | 71.4 | 55.5 | 86 | 33 | 63.5 | 417 | 179 | 0 | 0 | 135 | 89 |
| DEC | 58.5 | 39.9 | 77 | 29 | 49.2 | 65 | 12 | 0 | 3 | 493 | 4 |

PRECIPITATION (in.):

| MON | TOTAL | GREATEST 24-HOUR | PERCENT RAINDAYS | CUMULATIVE TOTAL |
|---|---|---|---|---|
| JAN | 2.57 | 0.80 | 23 | 2.57 |
| FEB | 4.48 | 3.06 | 25 | 7.05 |
| MAR | 2.36 | 1.33 | 13 | 9.41 |
| APR | 1.87 | 1.33 | 10 | 11.28 |
| MAY | 2.71 | 1.20 | 29 | 13.99 |
| JUN | 4.63 | 1.02 | 37 | 18.62 |
| JUL | 5.60 | 2.15 | 32 | 24.22 |
| AUG | 1.81 | 0.95 | 23 | 26.03 |
| SEP | 2.11 | 0.59 | 30 | 28.14 |
| OCT | 5.48 | 1.41 | 29 | 33.62 |
| NOV | 10.15 | 3.58 | 33 | 43.77 |
| DEC | 6.45 | 2.50 | 19 | 50.22 |

NOTE: Temperature data obtained from the LSU-Ben Hur Research Farm. December data from the "Preliminary Climate Data" of the Nat'l Weather Service. Official data are not available at present.

Table 2. Sugarcane variety trials planted at the St. Gabriel Research Station in 1986.

| Series | Soil Type | Planting Date |
|---|---|---|
| 1983 L&CP | Commerce silt loam | 9/19/86 |
| 1983 L&CP | Sharkey clay | 8/28/86 |
| 1984 L&CP | Sharkey clay | 9/25/86 |
| 1985 L | Commerce silt loam | 9/26/86 |
| 1985 L | Sharkey clay | 9/08/86 |
| 1986 L | Commerce silt loam | 10/22/86 |
| 1986 L | Sharkey clay | 10/21/86 |

Table 3. The 1986 Infield variety trial results from the first stubble of the 1981 L & CP series on Commerce silt loam at St. Gabriel.

| VARIETY | CANE/ ACRE (TONS) | STALK WEIGHT (LBS) | STALKS/ ACRE (NO.) | JUICE SUCROSE (%) | SUGAR/ TON (LBS) | SUGAR/ ACRE (LBS) |
|---|---|---|---|---|---|---|
| CP 65-357 | 30.3 | 2.02 | 29980 | 17.8 | 263 | 7945 |
| CP 70-321 | 37.1 | 2.15 | 34345 | 17.1 | 250 | 9143 |
| CP 74-383 | 47.2 | 2.46 | 39102 | 16.6 | 245 | 11540 |
| LCP 81-010 | 44.5 | 2.60 | 34584 | 16.3 | 238 | 10598 |
| LCP 81-030 | 38.5 | 2.53 | 30549 | 17.8 | 264 | 10146 |
| CP 81-332 | 32.4 | 2.38 | 27157 | 17.7 | 258 | 8375 |
| LSD(.05) | 8.3 | .36 | NS | NS | NS | 1682 |
| HSD(.05) | 12.9 | .56 | NS | NS | NS | 2622 |

Planting Date: 9-16-84 Number of Replications: 3
Harvest Date: 11-24-86 Plot Size: 16 feet, 3 rows

Table 4. The 1986 Infield variety trial results from the second stubble of the 1981 L & CP series on Commerce silt loam at St. Gabriel.

| VARIETY | CANE/ ACRE (TONS)[1] | STALK WEIGHT (LBS) | STALKS/ ACRE (NO.) | JUICE SUCROSE (%) | SUGAR/ TON (LBS) | SUGAR/ ACRE (LBS)[1] |
|---|---|---|---|---|---|---|
| CP 65-357 | 34.4 | 2.56 | 27005 | 17.2 | 251 | 8623 |
| CP 70-321 | 42.8 | 2.26 | 37897 | 18.2 | 269 | 11505 |
| CP 74-383 | 46.0 | 2.23 | 41301 | 16.9 | 246 | 11331 |
| LCP 81-010 | 42.8 | 2.65 | 32905 | 16.8 | 246 | 10609 |
| LCP 81-030 | 41.5 | 2.51 | 32905 | 18.4 | 272 | 11260 |
| CP 81-332 | 39.3 | 2.22 | 35401 | 16.5 | 238 | 9364 |
| LSD(.05) | NS | NS | 7336 | NS | NS | NS |
| HSD(.05) | NS | NS | 12178 | NS | NS | NS |

Planting Date: 9-26-83 Number of Replications: 2
Harvest Date: 11-05-86 Plot Size: 16 feet, 3 rows

[1]Yields are based on stalk counts and mean stalk weights.

Table 5. The 1986 Infield variety trial results from the second stubble of the 1981 L series on Sharkey clay at St. Gabriel.

| VARIETY | CANE/ ACRE (TONS)[1] | STALK WEIGHT (LBS) | STALKS/ ACRE (NO.) | JUICE SUCROSE (%) | SUGAR/ TON (LBS) | SUGAR/ ACRE (LBS)[1] |
|---|---|---|---|---|---|---|
| CP 65-357 | 39.1 | 2.15 | 36536 | 17.2 | 252 | 9887 |
| CP 70-321 | 49.2 | 2.32 | 41982 | 16.7 | 247 | 12193 |
| CP 74-383 | 63.7 | 2.23 | 57186 | 16.0 | 232 | 14732 |
| LCP 81-010 | 66.3 | 2.87 | 46067 | 16.2 | 236 | 15586 |
| LCP 81-030 | 48.4 | 2.38 | 40620 | 17.6 | 260 | 12628 |
| LSD(.05) | NS | .32 | NS | NS | NS | NS |
| HSD(.05) | NS | .52 | NS | NS | NS | NS |

Planting Date: 9-27-83 Number of Replications: 2
Harvest Date: 11-06-86 Plot Size: 16 feet, 3 rows

[1]Yields are based on stalk counts and mean stalk weights.

Table 6. The 1986 Infield variety trial results from the plant cane of the 1982 L & CP series on Commerce silt loam at St. Gabriel.

| VARIETY | CANE/ ACRE (TONS) | STALK WEIGHT (LBS) | STALKS/ ACRE (NO.) | JUICE SUCROSE (%) | SUGAR/ TON (LBS) | SUGAR/ ACRE (LBS) | BROKEN STALKS (%) |
|---|---|---|---|---|---|---|---|
| CP 65-357 | 30.6 | 2.30 | 26827 | 17.4 | 254 | 7765 | 13 |
| CP 70-321 | 39.4 | 2.28 | 34430 | 18.0 | 266 | 10490 | 21 |
| CP 74-383 | 42.3 | 2.06 | 41184 | 17.9 | 263 | 11142 | 9 |
| LCP 82-046 | 46.9 | 2.53 | 37151 | 16.9 | 246 | 11515 | 21 |
| LCP 82-073 | 38.4 | 2.47 | 31741 | 17.9 | 263 | 10094 | 8 |
| LCP 82-089 | 39.1 | 1.97 | 39916 | 16.8 | 243 | 9505 | 17 |
| CP 82-513 | 36.4 | 2.53 | 28773 | 17.0 | 248 | 8999 | 36 |
| CP 82-519 | 39.1 | 2.39 | 32713 | 17.2 | 250 | 9776 | 24 |
| CP 82-520 | 31.9 | 2.33 | 27386 | 17.9 | 263 | 8374 | 34 |
| CP 82-537 | 32.6 | 1.69 | 38667 | 17.4 | 256 | 8328 | 13 |
| CP 82-547 | 41.6 | 2.47 | 33698 | 17.5 | 256 | 10676 | 25 |
| CP 82-550 | 36.8 | 1.89 | 38884 | 19.1 | 283 | 10429 | 35 |
| CP 82-551 | 39.6 | 2.00 | 39687 | 17.9 | 265 | 10506 | 6 |
| LSD(.05) | 6.9 | .40 | 7981 | NS | NS | NS | NS |
| HSD(.05) | 12.9 | .73 | NS | NS | NS | NS | NS |

Planting Date: 9-18-85 Number of Replications: 2
Harvest Date: 12-01-86 Plot Size: 16 feet, 3 rows

Table 7. The 1986 Infield variety trial results from the plant cane of the 1982 L & CP series on Sharkey clay at St. Gabriel.

| VARIETY | CANE/ ACRE (TONS) | STALK WEIGHT (LBS) | STALKS/ ACRE (NO.) | JUICE SUCROSE (%) | SUGAR/ TON (LBS) | SUGAR/ ACRE (LBS) | BROKEN STALKS (%) |
|---|---|---|---|---|---|---|---|
| CP 65-357 | 26.4 | 1.97 | 26934 | 19.3 | 285 | 7533 | 5 |
| CP 70-321 | 35.2 | 1.93 | 36668 | 17.5 | 260 | 9118 | 6 |
| CP 74-383 | 38.1 | 2.12 | 36185 | 17.2 | 252 | 9642 | 15 |
| LCP 82-046 | 33.9 | 2.52 | 26876 | 17.6 | 259 | 8792 | 43 |
| LCP 82-073 | 33.9 | 2.40 | 28203 | 18.3 | 270 | 9147 | 31 |
| LCP 82-089 | 32.2 | 1.78 | 36786 | 18.6 | 276 | 8879 | 34 |
| CP 82-513 | 29.9 | 2.29 | 26282 | 17.5 | 257 | 7651 | 22 |
| CP 82-519 | 43.3 | 2.18 | 39618 | 17.6 | 260 | 11283 | 22 |
| CP 82-520 | 31.9 | 2.29 | 27957 | 17.7 | 259 | 8211 | 35 |
| CP 82-537 | 37.1 | 1.59 | 46834 | 16.0 | 233 | 8616 | 32 |
| CP 82-547 | 34.9 | 1.99 | 35164 | 16.9 | 247 | 8606 | 28 |
| CP 82-550 | 29.9 | 1.58 | 38127 | 17.9 | 263 | 7830 | 17 |
| CP 82-551 | 35.8 | 1.71 | 41906 | 17.0 | 250 | 8960 | 18 |
| LSD(.05) | NS | .29 | 10404 | NS | NS | NS | NS |
| HSD(.05) | NS | .54 | 19280 | NS | NS | NS | NS |

Planting Date: 9-18-85 Number of Replications: 2
Harvest Date: 12-12-86 Plot Size: 16 feet, 3 rows

Table 8. The 1986 Infield variety trial results from the first stubble of the 1982 L & CP series on Commerce silt loam at St. Gabriel.

| VARIETY | CANE/ ACRE (TONS) | STALK WEIGHT (LBS) | STALKS/ ACRE (NO.) | JUICE SUCROSE (%) | SUGAR/ TON (LBS) | SUGAR/ ACRE (LBS) |
|---|---|---|---|---|---|---|
| CP 65-357 | 25.3 | 2.23 | 22608 | 18.7 | 275 | 6968 |
| CP 70-321 | 34.4 | 1.85 | 37041 | 17.5 | 259 | 8895 |
| CP 70-330 | 34.3 | 2.25 | 30500 | 18.5 | 273 | 9373 |
| CP 72-356 | 30.1 | 2.36 | 25587 | 18.2 | 266 | 8024 |
| CP 74-383 | 46.6 | 2.21 | 42209 | 17.7 | 260 | 12060 |
| LCP 82-046 | 42.6 | 2.45 | 34939 | 17.9 | 263 | 11210 |
| LCP 82-073 | 37.4 | 2.58 | 29043 | 18.6 | 272 | 10158 |
| LCP 82-089 | 33.7 | 2.10 | 32184 | 18.5 | 273 | 9186 |
| CP 82-513 | 33.4 | 2.24 | 29751 | 17.7 | 260 | 8681 |
| CP 82-519 | 43.5 | 2.29 | 37959 | 18.5 | 273 | 11846 |
| CP 82-520 | 36.1 | 1.92 | 37599 | 18.3 | 268 | 9679 |
| CP 82-537 | 32.0 | 1.80 | 35843 | 17.2 | 251 | 7987 |
| CP 82-547 | 44.3 | 2.04 | 43424 | 18.2 | 268 | 11841 |
| CP 82-550 | 31.3 | 1.94 | 32316 | 19.4 | 285 | 8914 |
| CP 82-551 | 37.0 | 2.01 | 36867 | 19.1 | 282 | 10430 |
| LSD(.05) | 8.1 | .34 | 5656 | NS | NS | 1996 |
| HSD(.05) | 15.2 | .64 | 10655 | NS | NS | 3760 |

Planting Date: 9-17-84 Number of Replications: 2
Harvest Date: 12-03-86 Plot Size: 16 feet, 3 rows

Table 9. The 1986 Infield variety trial results from the first stubble of the 1982 L series on Sharkey clay at St. Gabriel.

| VARIETY | CANE/ ACRE (TONS) | STALK WEIGHT (LBS) | STALKS/ ACRE (NO.) | JUICE SUCROSE (%) | SUGAR/ TON (LBS) | SUGAR/ ACRE (LBS) |
|---|---|---|---|---|---|---|
| CP 65-357 | 34.5 | 1.95 | 35356 | 18.4 | 270 | 9324 |
| CP 70-321 | 40.9 | 1.77 | 46218 | 17.4 | 256 | 10441 |
| CP 74-383 | 46.2 | 1.90 | 48665 | 16.6 | 243 | 11190 |
| LCP 82-046 | 48.5 | 1.97 | 49320 | 17.1 | 249 | 12079 |
| LCP 82-073 | 36.7 | 2.25 | 32547 | 17.7 | 259 | 9539 |
| LCP 82-089 | 40.5 | 1.60 | 51576 | 18.4 | 272 | 11012 |
| LSD(.05) | 6.8 | NS | 7988 | NS | NS | NS |
| HSD(.05) | 11.3 | NS | 13260 | NS | NS | NS |

Planting Date: 9-19-84 Number of Replications: 2
Harvest Date: 12-17-86 Plot Size: 16 feet, 3 rows

Table 10. The 1986 Infield variety trial results from the second stubble of the 1982 L series on Commerce silt loam at St. Gabriel.

| VARIETY | CANE/ ACRE (TONS)[1] | STALK WEIGHT (LBS) | STALKS/ ACRE (NO.) | JUICE SUCROSE (%) | SUGAR/ TON (LBS) | SUGAR/ ACRE (LBS)[1] |
|---|---|---|---|---|---|---|
| CP 65-357 | 25.8 | 2.18 | 23147 | 17.0 | 248 | 6371 |
| CP 70-321 | 37.6 | 2.46 | 30636 | 17.3 | 256 | 9589 |
| CP 74-383 | 45.7 | 2.47 | 37444 | 16.9 | 250 | 11430 |
| LCP 82-046 | 43.7 | 2.57 | 33812 | 16.4 | 240 | 10443 |
| LCP 82-073 | 40.2 | 2.87 | 28593 | 16.5 | 240 | 9557 |
| LCP 82-089 | 42.4 | 1.95 | 43571 | 16.1 | 235 | 9961 |
| LSD(.05) | NS | NS | NS | NS | NS | NS |
| HSD(.05) | NS | NS | NS | NS | NS | NS |

Planting Date: 10-03-83 Number of Replications: 2
Harvest Date: 11-05-86 Plot Size: 16 feet, 3 rows

[1]Yields are based on stalk counts and mean stalk weights.

Table 11. The 1986 Infield variety trial results from the second stubble of the 1982 L series on Sharkey clay at St. Gabriel.

| VARIETY | CANE/ ACRE (TONS)[1] | STALK WEIGHT (LBS) | STALKS/ ACRE (NO.) | JUICE SUCROSE (%) | SUGAR/ TON (LBS) | SUGAR/ ACRE (LBS)[1] |
|---|---|---|---|---|---|---|
| CP 65-357 | 25.8 | 2.13 | 24282 | 15.6 | 226 | 5805 |
| CP 70-321 | 33.9 | 1.88 | 36082 | 16.7 | 245 | 8305 |
| CP 74-383 | 48.9 | 2.33 | 41982 | 15.7 | 229 | 11328 |
| LCP 82-046 | 69.6 | 2.58 | 54009 | 16.0 | 232 | 16132 |
| LCP 82-073 | 45.6 | 2.42 | 37670 | 17.1 | 249 | 11336 |
| LCP 82-089 | 53.4 | 2.23 | 48109 | 17.0 | 245 | 13123 |
| LSD(.05) | 22.3 | .22 | NS | NS | NS | NS |
| HSD(.05) | 37.0 | .37 | NS | NS | NS | NS |

Planting Date: 10-04-83 Number of Replications: 2
Harvest Date: 11-06-86 Plot Size: 16 feet, 3 rows

[1]Yields are based on stalk counts and mean stalk weights.

Table 12. The 1986 Infield variety trial results from the plant cane of the 1983 L & CP series on Commerce silt loam at St. Gabriel.

| VARIETY | CANE/ ACRE (TONS) | STALK WEIGHT (LBS) | STALKS/ ACRE (NO.) | JUICE SUCROSE (%) | SUGAR/ TON (LBS) | SUGAR/ ACRE (LBS) | BROKEN STALKS (%) |
|---|---|---|---|---|---|---|---|
| CP 65-357 | 41.3 | 2.83 | 29097 | 17.5 | 257 | 10591 | 30 |
| CP 70-321 | 36.7 | 2.98 | 24701 | 18.7 | 278 | 10193 | 16 |
| CP 74-383 | 52.6 | 3.08 | 34228 | 16.3 | 237 | 12437 | 15 |
| LCP 83-123 | 41.6 | 2.48 | 33684 | 17.3 | 252 | 10489 | 24 |
| LCP 83-137 | 47.3 | 2.67 | 35430 | 16.8 | 244 | 11518 | 24 |
| LCP 83-149 | 44.3 | 2.89 | 30678 | 19.0 | 281 | 12411 | 31 |
| LCP 83-151 | 43.5 | 2.59 | 33658 | 17.7 | 258 | 11236 | 27 |
| LCP 83-153 | 44.7 | 2.81 | 32078 | 17.5 | 258 | 11484 | 11 |
| LCP 83-159 | 39.7 | 2.93 | 27159 | 19.2 | 285 | 11314 | 16 |
| LCP 83-164 | 31.8 | 2.25 | 28297 | 18.0 | 265 | 8419 | 7 |
| LCP 83-165 | 42.4 | 2.61 | 32601 | 17.2 | 252 | 10666 | 16 |
| LCP 83-169 | 43.5 | 2.41 | 36172 | 16.7 | 243 | 10578 | 14 |
| LCP 83-179 | 40.9 | 2.67 | 30685 | 18.3 | 267 | 10901 | 17 |
| L 83-193 | 48.5 | 3.18 | 30801 | 16.3 | 238 | 11524 | 19 |
| CP 83-606 | 43.5 | 3.17 | 27542 | 17.8 | 262 | 11400 | 19 |
| CP 83-607 | 47.7 | 2.73 | 34909 | 18.1 | 266 | 12698 | 36 |
| CP 83-625 | 41.2 | 2.81 | 29829 | 18.7 | 275 | 11359 | 16 |
| CP 83-631 | 37.1 | 3.21 | 23172 | 18.8 | 279 | 10340 | 43 |
| CP 83-632 | 48.5 | 2.72 | 35547 | 17.4 | 253 | 12284 | 47 |
| CP 83-637 | 32.8 | 3.00 | 22230 | 18.8 | 277 | 9084 | 39 |
| CP 83-644 | 34.1 | 2.67 | 25815 | 18.7 | 276 | 9400 | 28 |
| CP 83-649 | 55.2 | 2.57 | 43072 | 17.9 | 263 | 14558 | 28 |
| CP 83-657 | 50.3 | 2.57 | 39239 | 17.1 | 247 | 12396 | 46 |
| CP 83-659 | 44.3 | 2.40 | 37070 | 18.3 | 267 | 11824 | 26 |
| CP 83-670 | 40.1 | 2.70 | 29764 | 16.7 | 243 | 9763 | 47 |
| LSD(.05) | 7.3 | .51 | 6532 | 0.9 | 14 | 1955 | NS |
| HSD(.05) | 14.4 | NS | 12984 | 1.7 | 27 | 3866 | NS |

Planting Date: 9-23-85 Number of Replications: 2
Harvest Date: 12-03-86 Plot Size: 16 feet, 3 rows

Table 13. The 1986 Infield variety trial results from the plant cane of the 1983 L series on Sharkey clay at St. Gabriel.

| VARIETY | CANE/ ACRE (TONS) | STALK WEIGHT (LBS) | STALKS/ ACRE (NO.) | JUICE SUCROSE (%) | SUGAR/ TON (LBS) | SUGAR/ ACRE (LBS) |
|---|---|---|---|---|---|---|
| CP 65-357 | 32.9 | 2.16 | 30366 | 18.4 | 271 | 8924 |
| CP 70-321 | 37.3 | 2.04 | 36725 | 17.8 | 262 | 9751 |
| CP 74-383 | 40.3 | 2.42 | 33471 | 16.7 | 244 | 9815 |
| LCP 83-123 | 37.7 | 1.99 | 37947 | 17.2 | 250 | 9445 |
| LCP 83-137 | 40.5 | 1.76 | 46327 | 17.9 | 265 | 10718 |
| LCP 83-149 | 37.6 | 2.14 | 35654 | 18.8 | 276 | 10349 |
| LCP 83-151 | 27.8 | 1.76 | 31568 | 17.9 | 262 | 7261 |
| LCP 83-153 | 37.8 | 1.96 | 38372 | 16.8 | 247 | 9317 |
| LCP 83-159 | 35.5 | 2.30 | 30863 | 18.9 | 280 | 9964 |
| LCP 83-164 | 29.3 | 1.83 | 32150 | 17.1 | 251 | 7340 |
| LCP 83-165 | 39.4 | 1.98 | 39949 | 17.2 | 252 | 9980 |
| LCP 83-169 | 32.7 | 1.81 | 36202 | 17.0 | 248 | 8105 |
| LCP 83-179 | 34.1 | 2.08 | 32841 | 17.4 | 254 | 8675 |
| L 83-193 | 44.6 | 2.35 | 37907 | 18.1 | 266 | 11865 |
| LSD(.05) | 8.0 | .32 | NS | 1.3 | 21 | NS |
| HSD(.05) | 14.9 | .59 | NS | NS | NS | NS |

Planting Date: 10-07-85 Number of Replications: 2
Harvest Date: 12-04-86 Plot Size: 16 feet, 3 rows

Table 14. The 1986 Infield variety trial results from the first stubble of the 1983 L series on Commerce silt loam at St. Gabriel.

| VARIETY | CANE/ ACRE (TONS) | STALK WEIGHT (LBS) | STALKS/ ACRE (NO.) | JUICE SUCROSE (%) | SUGAR/ TON (LBS) | SUGAR/ ACRE (LBS) | BROKEN STALKS (%) |
|---|---|---|---|---|---|---|---|
| CP 65-357 | 35.1 | 2.28 | 30792 | 19.1 | 281 | 9877 | 8 |
| CP 70-321 | 37.8 | 2.26 | 33384 | 18.5 | 274 | 10338 | 8 |
| CP 72-356 | 41.0 | 2.13 | 38468 | 18.0 | 263 | 10799 | 12 |
| CP 74-383 | 39.6 | 2.07 | 38257 | 17.2 | 252 | 9971 | 10 |
| LCP 83-123 | 32.5 | 1.72 | 37800 | 17.4 | 256 | 8323 | 16 |
| LCP 83-137 | 39.6 | 1.72 | 46100 | 18.7 | 278 | 11001 | 10 |
| LCP 83-149 | 40.3 | 2.03 | 39746 | 20.3 | 302 | 12154 | 8 |
| LCP 83-151 | 42.3 | 1.84 | 45981 | 18.9 | 277 | 11721 | 4 |
| LCP 83-153 | 41.0 | 1.90 | 43167 | 18.6 | 276 | 11304 | 4 |
| LCP 83-159 | 32.5 | 2.16 | 30120 | 20.8 | 311 | 10091 | 12 |
| LCP 83-164 | 26.7 | 1.74 | 30693 | 18.9 | 280 | 7481 | 6 |
| LCP 83-165 | 35.8 | 1.81 | 39431 | 18.4 | 270 | 9670 | 4 |
| LCP 83-169 | 38.1 | 2.06 | 36917 | 18.2 | 268 | 10199 | 8 |
| LCP 83-179 | 41.6 | 1.99 | 41905 | 18.9 | 277 | 11527 | 14 |
| L 83-193 | 36.5 | 2.29 | 31880 | 18.9 | 282 | 10297 | 18 |

Planting Date: 10-03-84 Number of Replications: 1
Harvest Date: 12-01-86 Plot Size: 16 feet, 3 rows

Table 15. The 1986 Infield variety trial results from the second stubble of the 1983 L series on Commerce silt loam at St. Gabriel.

| VARIETY | CANE/ ACRE (TONS) | STALK WEIGHT (LBS) | STALKS/ ACRE (NO.) | JUICE SUCROSE (%) | SUGAR/ TON (LBS) | SUGAR/ ACRE (LBS) |
|---|---|---|---|---|---|---|
| CP 65-357 | 33.5 | 1.94 | 34425 | 18.3 | 269 | 9018 |
| CP 70-321 | 23.7 | 1.94 | 24533 | 17.9 | 266 | 6309 |
| CP 74-383 | 37.8 | 2.02 | 37447 | 18.6 | 275 | 10395 |
| LCP 83-123 | 29.7 | 1.44 | 41317 | 16.9 | 246 | 7306 |
| LCP 83-137 | 34.1 | 1.43 | 47831 | 18.5 | 274 | 9326 |
| LCP 83-149 | 31.2 | 1.47 | 42456 | 19.7 | 294 | 9163 |
| LCP 83-151 | 37.2 | 1.51 | 49091 | 17.6 | 256 | 9523 |
| LCP 83-153 | 33.5 | 1.58 | 42283 | 19.2 | 286 | 9584 |
| LCP 83-159 | 27.5 | 2.01 | 27350 | 20.8 | 311 | 8555 |
| LCP 83-164 | 33.5 | 1.67 | 40103 | 18.4 | 273 | 9132 |
| LCP 83-165 | 31.9 | 1.46 | 43647 | 17.7 | 259 | 8275 |
| LCP 83-169 | 31.9 | 1.47 | 43392 | 18.4 | 271 | 8635 |
| LCP 83-179 | 44.5 | 1.86 | 47963 | 19.4 | 285 | 12669 |
| L 83-193 | 37.2 | 1.87 | 39633 | 17.5 | 260 | 9653 |

Planting Date: 10-17-83 Number of Replications: 1
Harvest Date: 11-03-86 Plot Size: 14 feet, 3 rows

Table 16. The 1986 Infield variety trial results from the plant cane of the 1984 L series on Commerce silt loam at St. Gabriel.

| VARIETY | CANE/ ACRE (TONS) | STALK WEIGHT (LBS) | STALKS/ ACRE (NO.) | JUICE SUCROSE (%) | SUGAR/ TON (LBS) | SUGAR/ ACRE (LBS) | BROKEN STALKS (%) |
|---|---|---|---|---|---|---|---|
| CP 65-357 | 30.6 | 2.25 | 27135 | 19.4 | 286 | 8709 | 11 |
| CP 70-321 | 34.8 | 2.06 | 33843 | 18.3 | 272 | 9470 | 26 |
| CP 74-383 | 41.7 | 2.47 | 33736 | 17.7 | 261 | 10861 | 20 |
| LCP 84-200 | 32.5 | 2.30 | 28270 | 18.6 | 273 | 8873 | 16 |
| L 84-205 | 36.8 | 2.26 | 32559 | 19.0 | 282 | 10351 | 36 |
| LCP 84-211 | 40.7 | 2.61 | 31420 | 17.5 | 256 | 10408 | 46 |
| LCP 84-212 | 41.3 | 2.21 | 37698 | 18.8 | 275 | 11368 | 14 |
| LCP 84-214 | 38.4 | 2.29 | 33765 | 19.3 | 287 | 11020 | 10 |
| LCP 84-215 | 37.7 | 1.74 | 43450 | 18.4 | 272 | 10258 | 8 |
| LCP 84-222 | 46.2 | 2.26 | 40852 | 18.1 | 266 | 12290 | 12 |
| L 84-238 | 34.2 | 1.70 | 40558 | 17.1 | 251 | 8566 | 10 |
| L 84-245 | 37.1 | 1.98 | 37524 | 18.1 | 267 | 9912 | 18 |
| L 84-247 | 35.5 | 2.03 | 35002 | 17.4 | 254 | 9007 | 22 |
| LCP 84-257 | 34.5 | 2.52 | 27448 | 18.0 | 266 | 9144 | 11 |
| L 84-262 | 30.3 | 1.97 | 30789 | 19.1 | 283 | 8556 | 21 |
| L 84-264 | 32.6 | 2.03 | 32149 | 17.6 | 256 | 8347 | 42 |

---continued---

Table 16. (continued)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| L 84-265 | 37.5 | 2.06 | 36775 | 17.7 | 259 | 9685 | 6 |
| L 84-266 | 39.4 | 1.99 | 39555 | 18.5 | 273 | 10743 | 13 |
| L 84-273 | 34.2 | 2.09 | 32737 | 18.7 | 277 | 9462 | 23 |
| L 84-275 | 37.1 | 1.65 | 45466 | 18.0 | 266 | 9824 | 35 |
| L 84-276 | 41.3 | 2.11 | 39445 | 19.0 | 280 | 11534 | 8 |
| L 84-280 | 36.1 | 1.91 | 37832 | 17.6 | 258 | 9305 | 10 |
| L 84-281 | 26.7 | 1.88 | 28636 | 17.3 | 252 | 6742 | 2 |
| L 84-290 | 38.7 | 1.86 | 41561 | 18.3 | 269 | 10401 | 10 |
| LSD(.05) | 5.2 | .28 | 7935 | 0.9 | 15 | 1445 | 20 |
| HSD(.05) | 10.3 | .56 | 15708 | 1.8 | 30 | 2861 | 39 |

Planting Date: 9-26-85 Number of Replications: 2
Harvest Date: 12-10-86 Plot Size: 16 feet, 3 rows

Table 17. The 1986 Infield variety trial results from the first stubble of the 1984 L series on Commerce silt loam at St. Gabriel.

| VARIETY | CANE/ ACRE (TONS) | STALK WEIGHT (LBS) | STALKS/ ACRE (NO.) | JUICE SUCROSE (%) | SUGAR/ TON (LBS) | SUGAR/ ACRE (LBS) |
|---|---|---|---|---|---|---|
| CP 65-357 | 25.0 | 1.90 | 26614 | 19.6 | 292 | 7298 |
| CP 70-321 | 38.2 | 1.97 | 38790 | 18.7 | 280 | 10696 |
| CP 74-383 | 45.8 | 2.18 | 41961 | 18.0 | 266 | 12180 |
| LCP 84-200 | 42.3 | 2.00 | 42414 | 19.2 | 287 | 12153 |
| L 84-205 | 29.2 | 1.94 | 30133 | 19.8 | 297 | 8658 |
| LCP 84-211 | 38.2 | 2.25 | 33893 | 19.1 | 285 | 10868 |
| LCP 84-212 | 31.2 | 1.74 | 35941 | 19.5 | 289 | 9011 |
| LCP 84-214 | 33.3 | 1.95 | 34097 | 21.0 | 316 | 10523 |
| LCP 84-215 | 31.9 | 1.95 | 32687 | 19.5 | 292 | 9312 |
| LCP 84-222 | 40.9 | 2.07 | 39502 | 17.6 | 260 | 10626 |
| L 84-238 | 30.5 | 1.30 | 47020 | 17.6 | 260 | 7924 |
| L 84-245 | 38.9 | 1.87 | 41659 | 18.0 | 265 | 10320 |
| L 84-247 | 28.8 | 1.44 | 40120 | 18.1 | 268 | 7718 |
| LCP 84-257 | 33.3 | 2.30 | 28989 | 19.5 | 291 | 9700 |
| L 84-262 | 32.6 | 1.62 | 40319 | 20.3 | 303 | 9871 |
| L 84-264 | 34.7 | 2.25 | 30763 | 18.3 | 271 | 9386 |
| L 84-265 | 37.4 | 1.63 | 46032 | 18.9 | 281 | 10506 |
| L 84-266 | 35.0 | 1.84 | 38037 | 19.2 | 286 | 10013 |

Planting Date: 10-26-84 Number of Replications: 1
Harvest Date: 11-13-86 Plot Size: 16 feet, 3 rows

Table 18. The 1986 Infield variety trial results from the first stubble of the 1984 L series on Sharkey clay at St. Gabriel.

| VARIETY | CANE/ ACRE (TONS) | STALK WEIGHT (LBS) | STALKS/ ACRE (NO.) | JUICE SUCROSE (%) | SUGAR/ TON (LBS) | SUGAR/ ACRE (LBS) |
|---|---|---|---|---|---|---|
| CP 61-037 | 52.0 | 2.28 | 45660 | 16.2 | 239 | 12428 |
| CP 65-357 | 47.1 | 2.39 | 39424 | 18.4 | 273 | 12868 |
| CP 70-321 | 40.2 | 2.16 | 37291 | 18.5 | 277 | 11147 |
| CP 74-383 | 46.4 | 1.96 | 47368 | 19.3 | 286 | 13256 |
| LCP 84-200 | 53.4 | 1.99 | 53766 | 17.6 | 260 | 13905 |
| L 84-205 | 37.4 | 1.93 | 38839 | 18.3 | 272 | 10184 |
| LCP 84-211 | 38.2 | 1.69 | 45306 | 17.6 | 262 | 9997 |
| LCP 84-212 | 38.9 | 1.65 | 47083 | 18.1 | 266 | 10328 |
| LCP 84-214 | 38.2 | 1.99 | 38442 | 18.6 | 277 | 10578 |
| LCP 84-215 | 44.1 | 1.72 | 51549 | 17.6 | 260 | 11409 |
| LCP 84-222 | 55.5 | 1.89 | 58636 | 18.2 | 270 | 14996 |
| L 84-238 | 29.2 | 1.51 | 38523 | 16.7 | 245 | 7166 |
| L 84-245 | 44.4 | 2.03 | 43729 | 18.3 | 272 | 12090 |
| L 84-247 | 43.7 | 1.86 | 47037 | 17.0 | 250 | 10925 |
| LCP 84-257 | 55.5 | 2.98 | 37283 | 18.6 | 276 | 15301 |
| L 84-262 | 44.4 | 1.88 | 47123 | 18.1 | 269 | 11930 |
| L 84-264 | 57.5 | 1.95 | 58943 | 16.1 | 233 | 13403 |
| L 84-265 | 45.1 | 2.09 | 43128 | 17.6 | 260 | 11717 |
| L 84-266 | 45.1 | 2.30 | 39251 | 18.4 | 273 | 12294 |
| L 84-273 | 42.3 | 1.75 | 48235 | 18.6 | 274 | 11607 |
| L 84-275 | 43.0 | 1.73 | 49751 | 16.8 | 250 | 10754 |
| L 84-276 | 48.9 | 2.19 | 44627 | 18.7 | 276 | 13492 |
| L 84-280 | 38.5 | 1.89 | 40727 | 17.7 | 263 | 10110 |
| L 84-281 | 30.2 | 1.79 | 33750 | 16.3 | 238 | 7191 |
| L 84-290 | 43.3 | 1.69 | 51168 | 18.6 | 276 | 11964 |

Planting Date: 11-15-84 Number of Replications: 1
Harvest Date: 12-11-86 Plot Size: 15 feet, 3 rows

Table 19. The 1986 Infield variety trial results from the plant cane of the 1985 L series on Commerce silt loam at St. Gabriel.

| VARIETY | CANE/ ACRE (TONS)[1] | STALK WEIGHT (LBS) | STALKS/ ACRE (NO.) | JUICE SUCROSE (%) | SUGAR/ TON (LBS) | SUGAR/ ACRE (LBS)[1] |
|---|---|---|---|---|---|---|
| CP 65-357 | 35.8 | 2.75 | 25807 | 17.3 | 254 | 8990 |
| CP 70-321 | 41.1 | 2.87 | 29033 | 16.8 | 246 | 10121 |
| CP 74-383 | 46.8 | 3.00 | 31250 | 16.5 | 239 | 11188 |
| L 85-294 | 34.5 | 2.96 | 23387 | 17.6 | 259 | 8927 |
| LCP 85-295 | 33.1 | 2.29 | 28831 | 15.8 | 228 | 7694 |
| LCP 85-296 | 38.1 | 2.40 | 31855 | 16.7 | 243 | 9383 |
| LCP 85-298 | 40.9 | 2.56 | 32057 | 15.7 | 227 | 9264 |
| LCP 85-307 | 43.5 | 2.83 | 30646 | 17.5 | 260 | 11333 |
| LCP 85-313 | 51.6 | 2.45 | 41936 | 16.8 | 245 | 12710 |
| LCP 85-315 | 48.9 | 2.95 | 33065 | 16.5 | 238 | 11760 |
| LCP 85-316 | 31.8 | 2.19 | 29234 | 17.8 | 261 | 8296 |
| LCP 85-319 | 31.3 | 2.97 | 21170 | 16.1 | 232 | 7255 |
| LCP 85-320 | 22.9 | 1.93 | 23791 | 17.4 | 255 | 5827 |
| LCP 85-329 | 28.0 | 1.96 | 28629 | 15.8 | 230 | 6472 |
| LCP 85-335 | 43.5 | 3.21 | 27016 | 16.1 | 236 | 10186 |
| LCP 85-336 | 45.1 | 3.10 | 29033 | 17.1 | 252 | 11395 |
| LCP 85-337 | 33.0 | 2.95 | 21976 | 17.4 | 256 | 8481 |
| LCP 85-340 | 53.4 | 3.83 | 28024 | 17.1 | 249 | 13279 |
| LCP 85-341 | 28.5 | 2.12 | 27420 | 17.5 | 257 | 7332 |
| LCP 85-344 | 38.2 | 2.31 | 32863 | 17.6 | 261 | 9920 |
| LCP 85-346 | 42.2 | 2.65 | 31855 | 16.2 | 236 | 9933 |
| LCP 85-347 | 33.7 | 2.01 | 33266 | 16.3 | 237 | 7955 |
| LCP 85-352 | 43.7 | 2.71 | 32056 | 17.5 | 257 | 11177 |
| LCP 85-354 | 40.0 | 2.74 | 29234 | 16.9 | 243 | 9734 |
| LCP 85-358 | 42.4 | 2.77 | 30645 | 15.6 | 226 | 9584 |
| LCP 85-359 | 42.7 | 2.51 | 34073 | 17.4 | 254 | 10826 |
| LCP 85-360 | 38.5 | 2.79 | 27621 | 16.8 | 246 | 9473 |
| LCP 85-361 | 36.1 | 2.52 | 28629 | 16.5 | 239 | 8611 |
| LCP 85-369 | 36.4 | 2.10 | 34678 | 17.5 | 257 | 9339 |
| LCP 85-371 | 27.9 | 2.40 | 23186 | 16.6 | 240 | 6666 |
| LCP 85-373 | 55.5 | 2.71 | 41331 | 16.5 | 239 | 13280 |
| LCP 85-376 | 35.9 | 2.54 | 28226 | 17.7 | 259 | 9287 |
| LCP 85-378 | 34.7 | 2.12 | 32662 | 17.5 | 258 | 8912 |
| LCP 85-384 | 50.2 | 2.61 | 38508 | 17.1 | 251 | 12628 |
| LCP 85-385 | 41.7 | 2.89 | 28831 | 15.7 | 226 | 9385 |
| LSD(.05) | 13.9 | .49 | 8317 | NS | NS | 3891 |
| HSD(.05) | 28.5 | 1.01 | 17075 | NS | NS | NS |

Planting Date: 10-22-85 Number of Replications: 2
Harvest Date: 12-04-86 Plot Size: 18 feet, 1 row

[1]Yields are based on stalk counts and mean stalk weights.

# VARIETAL EVALUATION AT THE IBERIA RESEARCH STATION

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One of the most perplexing challenges confronting a plant breeder is knowing where to locate early-generation, experimental lines for agronomic evaluation. The breeder has a choice of screening the germplasm in a number of soil type/environment combinations to determine general adaptation to all the commercial production areas or screening for adaptation to a specific location. Obviously, the costs in money, time and personnel, to some extent, dictate the number of locations involved in the testing program. Specific adaptation of such cultivars as NCo 310, CP 48-103 and others is common knowledge among growers and suggests that perhaps consideration should be given to expanding the number of sites on which the infield tests are planted. However, in order to determine whether such an expansion should become an institutionalized part of the sugarcane breeding program, it was decided to plant some of the 1985 assignments at one additional site to contrast their performance with that achieved at other locations. Should meaningful interactions occur between the genotypes and the various environments, a decision then will be made on how to utilize the information to increase the effectiveness of the sugarcane breeding program. Since the Bayou Teche area was the only one of the three general cane growing areas not represented in the infield testing program, the Iberia Research Station was the logical choice for the study. The results presented in this report are for the 1986 growing season and will have to be combined with data from additional years before valid conclusions can be drawn. It is our hope that ultimately the growers along Bayou Teche will benefit from this effort.

Performance of clones:

Table 1 shows the performance of thirty-two 1985 LSU assignments and the four commercial varieties included for comparison. Calculated yields revealed that half of the clones exhibited higher sugar/acre than the highest yielding commercial variety, CP 70-321. Sucrose averaged 15.8 for the commercial entries and 15.7 with a range of 13.6 to 17.6 for the experimental clones. Tonnage and TRS were quite good relative to the checks and averaged 46.3 tons of cane/acre and 226 lbs. sugar/ton, respectively. Of course, the promising clones will be more closely scrutinized during the ratoon crops and their stubbling ability, harvestability and pest resistance along with yield stability across environments will eventually determine their tenure in the selection program.

Table 1. The 1986 Infield variety trial results from the plant cane of the 1985 L series on Baldwin silty clay loam at the Iberia Research Station.

| VARIETY | CANE/ ACRE (TONS) | STALK WEIGHT (LBS) | STALKS ACRE (NO.) | JUICE SUCROSE (%) | SUGAR/ TON (LBS) | SUGAR/ ACRE (LBS) |
|---|---|---|---|---|---|---|
| CP 61-037 | 34.9 | 2.58 | 27046 | 14.7 | 211 | 7378 |
| CP 65-357 | 42.8 | 2.90 | 29546 | 16.1 | 233 | 9932 |
| CP 70-321 | 42.9 | 2.38 | 36137 | 16.3 | 237 | 10166 |
| CP 74-383 | 42.2 | 2.78 | 30682 | 16.0 | 233 | 9810 |
| L 85-294 | 36.3 | 2.68 | 27273 | 16.6 | 241 | 8663 |
| LCP 85-295 | 26.8 | 2.60 | 20455 | 16.4 | 237 | 6405 |
| LCP 85-296 | 55.3 | 2.85 | 38637 | 14.5 | 208 | 11666 |
| LCP 85-298 | 48.0 | 2.51 | 38637 | 14.8 | 212 | 10156 |
| LCP 85-307 | 46.1 | 2.50 | 36819 | 16.6 | 243 | 11142 |
| LCP 85-313 | 39.3 | 1.82 | 43636 | 15.8 | 230 | 9046 |
| LCP 85-315 | 50.3 | 2.32 | 43409 | 15.2 | 218 | 10994 |
| LCP 85-316 | 50.2 | 2.28 | 44091 | 16.7 | 242 | 12113 |
| LCP 85-319 | 42.4 | 2.56 | 33409 | 13.6 | 190 | 8008 |
| LCP 85-320 | 33.4 | 2.11 | 31591 | 16.7 | 243 | 8103 |
| LCP 85-329 | 52.0 | 2.92 | 35455 | 17.1 | 249 | 12943 |
| LCP 85-335 | 41.6 | 3.05 | 27273 | 15.3 | 221 | 9171 |
| LCP 85-336 | 60.2 | 3.25 | 37046 | 16.8 | 245 | 14832 |
| LCP 85-337 | 53.5 | 2.98 | 35909 | 14.8 | 199 | 10619 |
| LCP 85-340 | 49.7 | 3.13 | 31818 | 16.1 | 232 | 11502 |
| LCP 85-341 | 33.8 | 2.08 | 32500 | 17.0 | 249 | 8390 |
| LCP 85-344 | 35.0 | 2.24 | 30227 | 15.3 | 220 | 7612 |
| LCP 85-346 | 52.2 | 3.22 | 32728 | 16.0 | 231 | 12052 |
| LCP 85-347 | 33.1 | 2.02 | 32500 | 14.1 | 198 | 6610 |
| LCP 85-352 | 40.4 | 1.98 | 42046 | 15.6 | 224 | 9069 |
| LCP 85-354 | 35.8 | 2.37 | 30227 | 14.2 | 199 | 7144 |
| LCP 85-358 | 71.4 | 3.32 | 42727 | 15.8 | 228 | 16309 |
| LCP 85-359 | 51.5 | 2.40 | 42955 | 15.3 | 217 | 11190 |
| LCP 85-360 | 52.8 | 2.99 | 35228 | 17.6 | 259 | 13668 |
| LCP 85-361 | 41.2 | 2.47 | 33409 | 15.4 | 219 | 9028 |
| LCP 85-369 | 36.5 | 2.23 | 33182 | 16.1 | 233 | 8488 |
| LCP 85-371 | 57.2 | 2.83 | 40455 | 16.6 | 240 | 13734 |
| LCP 85-373 | 49.8 | 2.64 | 37500 | 14.6 | 207 | 10224 |
| LCP 85-376 | 53.6 | 2.96 | 36212 | 16.2 | 233 | 12397 |
| LCP 85-378 | 38.2 | 2.03 | 37727 | 16.8 | 245 | 9350 |
| LCP 85-384 | 51.1 | 2.22 | 45909 | 16.1 | 234 | 11951 |
| LCP 85-385 | 62.4 | 2.79 | 43864 | 13.6 | 191 | 11592 |
| LSD(.05) | 18.3 | .58 | 10798 | 1.7 | 30 | 4011 |
| HSD(.05) | 37.7 | 1.19 | 22226 | 3.5 | 61 | 8257 |

Planting Date: 11-14-85 Number of Replications: 2
Harvest Date: 11-19-86 Plot Size: 16 feet, 1 row

# Results from the Outfield Variety Trials Harvested in 1986[1/]

W. Dozier Lester and F. A. Martin

Sugar Station

Outfield variety testing is the final stage of the Louisiana sugarcane variety development program. In these trials, experimental varieties are evaluated along with recommended varieties under commercial farm conditions. The locations of these tests represent the soil types, managerial structures, and weather patterns of the major sugarcane producing areas of the state.

Except for a freeze late in March, the 1986 growing season began with near average temperatures. Favorable spring and summer growing conditions resulted in good stands of cane throughout the region. The outfield locations were frequently visited for various reasons throughout the growing and harvest season. Pathologists and entomologists from both LSU and USDA evaluated disease and insect pressures at the outfield locations. These data were recorded and used by the scientists in their respective disciplines to evaluate the resistance and/or susceptibility of all experimental varieties to specific crop pests.

The weather during the planting season was favorable and most cane was planted on schedule. The locations and dates of planting of the LSU outfield trials conducted in 1986 are found in Table 1. Four commercial and seventeen experimental varieties were planted in outfield trials in 1986. Of the experimental varieties, two were from the LCP 81 assignment series and three were from the LCP 82 assignment series. Three replications of each variety were planted in 3 row plots 32 feet long. A randomized block design was used at each location. Twenty-two experimental varieties were also introduced to the outfield in 1986. The list of varieties planted in the outfield appears in Table 2.

Harvest of the 1986 Louisiana sugarcane crop progressed well until mid-November when excessive rainfall caused severe lodging resulting in poor harvesting conditions. Due to mechanical problems with the weigh rig, harvesting of the outfield trials was delayed. All test field harvesting was completed by December 15, 1986.

A survey of outfield test conditions during harvest was instituted for all outfield locations. These characterizations will be used as a data gathering tool and will furnish specific harvest information for each location. This added information will help to better evaluate potential new varieties and compare them to commercial varieties in the test.

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1/ The data for this report were obtained through a cooperative effort of personnel from the Louisiana Agricultural Experimental Station-LSUAC; USDA- Agricultural Research Service, Sugarcane Research Unit; and the American Sugar Cane League in accordance to the provisions of the "Three-way Agreement of 1978". The testing program would not be possible without full cooperation from the growers at each outfield location.

The data obtained in 1986 for sugar per acre, sugar per ton, tons of cane per acre, stalks per acre and mean stalk weight in plant cane, first stubble, and second stubble are presented in Tables 3 through 15.

Table 1. Locations and dates of planting for the LSU outfield variety trials planted in 1986.

| Locations | Date Planted | Soil Type |
|---|---|---|
| A.V. Allain & Sons | 09/12/86 | Baldwin silty clay |
| Cinclare | 10/02/86 | Convent silt loam |
| Evan Hall1/ | 09/18/86 | Sharkey clay |
| Frank Pearce & Sons | 09/11/86 | Commerce silt loam |
| Glenwood | 10/06/86 | Commerce silt loam |
| Lanaux's | 09/10/86 | Commerce silt loam |

1/ Due to a stand failure of the 1985 planting, only a seed increase was planted.

Table 2. Varieties planted in the outfield variety trials in 1986.

| Commercial varieties | Experimental varieties | | Varieties introduced to outfield | |
|---|---|---|---|---|
| CP65-357 | CP79-318 | CP82-513 | LCP83-123 | CP83-606 |
| CP70-321 | CP79-332 | CP82-519 | LCP83-137 | CP83-607 |
| CP74-383 | CP80-323 | CP82-520 | LCP83-149 | CP83-625 |
| CP76-331 | CP80-356 | CP82-537 | LCP83-151 | CP83-631 |
| CP65-357KT | LCP81-010 | CP82-547 | LCP83-153 | CP83-632 |
| CP70-321KT | LCP81-030 | CP82-550 | LCP83-159 | CP83-637 |
| | CP81-332 | CP82-551 | LCP83-164 | CP83-644 |
| | LCP82-046 | | LCP83-165 | CP83-649 |
| | LCP82-073 | | LCP83-169 | CP83-657 |
| | LCP82-089 | | LCP83-179 | CP83-659 |
| | | | LCP83-193 | CP83-670 |

KT represents Kleentek seed source of this commercial variety introduced to the test location.

## GLENWOOD

The plant cane test (Table 3) was harvested under damp soil conditions. Johnsongrass was spotty in the alleys with very little weed pressure in the test plots. There was a sparse, tall stand of cane with most varieties standing. A one row harvester was used to cut the field in two directions. A few varieties were lodged and did not harvest well.

Table 3. The 1986 results for plant cane variety trial at Glenwood.

| VARIETY | MEAN STALK WEIGHT | STALKS PER ACRE | TONS PER ACRE | SUGAR PER TON | SUGAR PER ACRE |
|---|---|---|---|---|---|
| CP65-357 | 2.17 | 25124 | 27.2 | 238 | 6459 |
| CP65-357KT | 2.19 | 29029 | 31.8 | 223 | 7085 |
| CP70-321 | 2.17 | 27261 | 30.3 | 227 | 6876 |
| CP72-356** | 2.15 | 21709 | 23.4 | 273 | 6387 |
| CP72-370 | 2.30 | 25731 | 29.6 | 255 | 7546 |
| CP74-383 | 2.20 | 29446 | 32.2 | 225 | 7226 |
| CP76-331 | 2.28 | 25484 | 28.9 | 246 | 7122 |
| CP79-318 | 2.30 | 23044 | 26.1 | 255 | 6668 |
| CP79-332 | 2.20 | 26425 | 29.0 | 246 | 7121 |
| CP80-323 | 2.02 | 29130 | 29.4 | 229 | 6739 |
| CP80-356 | 2.70 | 19455 | 26.2 | 234 | 6119 |
| LCP81-010 | 2.81 | 22914 | 32.1 | 215 | 6886 |
| LCP81-030 | 2.33 | 24272 | 28.1 | 246 | 6934 |
| CP81-332 | 2.06 | 24242 | 24.7 | 223 | 5521 |
| LSD | .26 | 3952 | 2.3 | 15 | 688 |
| HSD | .47 | 7110 | 4.1 | 27 | 1235 |

Date Planted: 10/09/85 Soil Type: Light
Date Harvested: 11/24/86 Harvest Conditions: Good

KT represents Kleentek seed source of this commercial variety brought to this location in 1983.
** Only two replications used in analysis

The first and second stubble tests (Tables 4 and 5) were cut under good conditions. In the first stubble there was some johnsongrass in the alleys with very little in the test plots. A few varieties were lodged, but the one row harvester, which cut the field in two directions, did a good job of placing all cane on the heap.

Table 4. The 1986 results for 1st stubble variety trial at Glenwood.

| VARIETY | MEAN STALK WEIGHT | STALKS PER ACRE | TONS PER ACRE | SUGAR PER TON | SUGAR PER ACRE |
|---|---|---|---|---|---|
| CP65-357KT | 1.70 | 40747 | 34.7 | 234 | 8129 |
| CP70-321 | 2.13 | 28118 | 30.0 | 248 | 7433 |
| CP72-356 | 2.06 | 27587 | 28.5 | 248 | 7047 |
| CP72-370 | 2.24 | 27131 | 30.4 | 261 | 7957 |
| CP74-383* | 1.95 | 39648 | 38.7 | 215 | 8328 |
| CP76-331 | 2.09 | 30832 | 32.1 | 265 | 8491 |
| CP79-318 | 2.03 | 32046 | 32.5 | 254 | 8228 |
| CP79-332 | 1.90 | 32471 | 30.9 | 261 | 8072 |
| CP80-323 | 2.10 | 29429 | 30.9 | 253 | 7793 |
| CP80-356 | 2.50 | 23608 | 29.5 | 254 | 7485 |
| LSD | .25 | 4996 | 4.2 | 17 | NS |
| HSD | .43 | 8582 | 7.2 | 29 | NS |

Date Planted: 10/29/84 Soil Type: Light
Date Harvested: 11/07/86 Harvest Conditions: Poor

KT represents Kleentek seed source of this commercial variety brought to this location in 1983.
* Only one replications used in analysis

Table 5. The 1986 results for 2nd stubble variety trial at Glenwood.

| VARIETY | MEAN STALK WEIGHT | STALKS PER ACRE | TONS PER ACRE | SUGAR PER TON | SUGAR PER ACRE |
|---|---|---|---|---|---|
| CP65-357 | 1.08 | 19143 | 16.9 | 248 | 4203 |
| CP65-357KT | 1.57 | 28259 | 22.1 | 235 | 5110 |
| CP70-321 | 1.86 | 20236 | 19.2 | 232 | 4450 |
| CP72-356 | 1.85 | 24236 | 22.3 | 246 | 5465 |
| CP72-370** | 1.75 | 30631 | 26.7 | 257 | 6868 |
| CP74-383 | 1.66 | 31452 | 26.1 | 222 | 5782 |
| CP76-331 | 1.81 | 29505 | 26.7 | 256 | 6830 |
| CP79-318 | 1.83 | 26563 | 24.2 | 243 | 5905 |
| CP79-332 | 1.80 | 27834 | 24.9 | 269 | 6705 |
| LSD | NS | 7055 | 4.9 | 22 | 1222 |
| HSD | NS | 11882 | 8.3 | 37 | 2058 |

Date Planted: 09/29/83 Soil Type: Light
Date Harvested: 11/07/86 Harvest Conditions: Poor

KT represents Kleentek seed source of this commercial variety brought to this location in 1983.
** Only two replications used in the analysis.

## LANAUX

The plant cane test at Lanaux (Table 6) was harvested under wet conditions. The field was free of weeds. The test was harvested with a two row harvester. Due to lodging in the field cutting was done in one direction .

Table 6. The 1986 results for plant cane variety trial at Lanaux.

| VARIETY | MEAN STALK WEIGHT | STALKS PER ACRE | TONS PER ACRE | SUGAR PER TON | SUGAR PER ACRE |
|---|---|---|---|---|---|
| CP65-357 | 2.08 | 28102 | 29.1 ③ | 267 | 7770 |
| CP65-357KT | 1.85 | 36484 | 33.8 | 256 | 8653 |
| CP70-321 | 2.05 | 30612 | 31.3 | 257 | 8051 |
| CP72-356 | 2.15 | 18858 | 20.2 ④ | 259 | 5253 |
| CP72-370 | 2.02 | 29362 | 29.6 | 260 | 7700 |
| CP74-383 | 2.15 | 32520 | 34.9 ② | 224 | 7810 |
| CP76-331 | 2.15 | 26863 | 28.9 | 274 | 7939 |
| CP79-318 | 2.04 | 29564 | 30.2 | 243 | 7319 |
| CP79-332 | 2.10 | 21432 | 22.5 | 258 | 5800 |
| CP80-323 | 2.26 | 22698 | 25.4 | 233 | 5919 |
| CP80-356 | 2.71 | 27866 | 37.7 | 236 | 8885 |
| LCP81-010 | 2.73 | 27734 | 37.5 ① | 231 | 8631 |
| LCP81-030 | 2.37 | 20096 | 23.8 | 266 | 6333 |
| CP81-332 | 2.03 | 28695 | 29.2 | 234 | 6807 |
| LSD | 0.22 | 4074 | 4.1 | 20 | 1159 |
| HSD | 0.39 | 7301 | 7.4 | 36 | 2077 |

Date Planted: 10/02/85 Soil Type: Light
Date Harvested: 12/09/86 Harvest Conditions: Poor

KT represents Kleentek seed source of this commercial variety brought to this location in 1983.

Harvesting of the first and second stubble tests (Tables 7 and 8) occured during rain. Both tests had standing water on one end of the test field. Weed pressure was low with some johnsongrass in the alleys. In these tests, most varieties were lodged, which necessitated cutting the field in one direction. All varieties were "scrappy on the heap" except CP72-370 which was still standing and harvested well. The two row harvester shattered the stubble as it cut and pulled up stools. The harvest conditions could have an adverse effect on yields next year.

Table 7. The 1986 results for first stubble variety trials at Lanaux.

| VARIETY | MEAN STALK WEIGHT | STALKS PER ACRE | TONS PER ACRE | SUGAR PER TON | SUGAR PER ACRE |
|---|---|---|---|---|---|
| CP65-357 | 2.26 | 19280 | 21.3 | 264 | 5653 |
| CP65-357KT | 1.72 | 28125 | 24.3 | 273 | 6623 |
| CP72-356 | 2.12 | 22660 | 23.7 | 265 | 6299 |
| CP72-370 | 1.88 | 24882 | 23.4 | 263 | 6142 |
| CP74-383 | 2.00 | 31559 | 31.7 | 242 | 7764 |
| CP76-331 | 1.97 | 25341 | 24.8 | 275 | 6798 |
| CP79-318 | 1.96 | 30496 | 29.9 | 272 | 8140 |
| CP79-332 | 1.96 | 19484 | 18.9 | 279 | 5239 |
| CP80-323 | 2.05 | 29539 | 30.0 | 252 | 7570 |
| CP80-356 | 2.61 | 14565 | 18.8 | 240 | 4475 |
| LSD | 0.31 | 8365 | NS | 18 | NS |
| HSD | 0.53 | 14275 | NS | 31 | NS |

Date Planted: 09/18/84 Soil Type: Light
Date Harvested: 11/26/86 Harvest Conditions: Poor

KT represents Kleentek seed source of this commercial variety brought to this location in 1983.

Table 8. The 1986 results for second stubble variety trial at Lanaux.

| VARIETY | MEAN STALK WEIGHT | STALKS PER ACRE | TONS PER ACRE | SUGAR PER TON | SUGAR PER ACRE |
|---|---|---|---|---|---|
| CP65-357 | 1.97 | 32722 | 32.1 | 264 | 8479 |
| CP65-357KT | 1.65 | 35641 | 29.4 | 266 | 7816 |
| CP70-321 | 1.98 | 35756 | 35.1 | 268 | 9412 |
| CP72-356 | 1.76 | 30741 | 25.3 | 278 | 7116 |
| CP72-370 | 1.73 | 32773 | 28.2 | 265 | 7455 |
| CP74-383 | 1.99 | 39744 | 39.3 | 249 | 9824 |
| CP76-331 | 1.91 | 29578 | 28.0 | 281 | 7896 |
| CP79-318 | 2.00 | 34947 | 34.8 | 268 | 9295 |
| CP79-332 | 1.91 | 22905 | 21.8 | 280 | 6108 |
| LSD | .16 | NS | 7.6 | 14 | 2156 |
| HSD | .26 | NS | 2.8 | 23 | 3631 |

Date Planted: 09/27/83 Soil Type: Light
Date Harvested: 11/25/86 Harvest Conditions: Poor

KT represents Kleentek seed source of this commercial variety brought to this location in 1983.

## EVAN HALL

Due to late planting under poor conditions in 1985 (11/19/85), the plant cane test had a very poor stand in most varieties. In consultation with the Evan Hall management, this test was abandoned.

The first stubble test was inadvertantly sprayed with Polado, and therefore not harvested in 1986.

Due to excessive harvesting damage in the 1985 first stubble test, the second stubble test was not harvested in 1986.

## CINCLARE

The plant cane and first stubble tests (Tables 9 and 10) were harvested under saturated conditions with water standing in the middles. Due to excessive harvesting damage in the 1985 first stubble test, second stubble test was not harvested in 1986. The row profile was normal. There were thick patches of johnsongrass scattered throughout the fields. Most varieties were lodged in these tests, more so in the plant cane than in the first stubble. Both tests were cut with a one row harvester in two directions. The harvester did a poor job of heaping the cane, leaving a large amount of scrap in the field.

Table 9. The 1986 results for plant cane variety trial at Cinclare.

| VARIETY | MEAN STALK WEIGHT | STALKS PER ACRE | TONS PER ACRE | SUGAR PER TON | SUGAR PER ACRE |
|---|---|---|---|---|---|
| CP65-357 | 2.23 | 22623 | 24.7 | 261 | 6406 |
| CP65-357KT | 1.87 | 37867 | 35.0 | 237 | 8279 |
| CP70-321 | 1.87 | 29927 | 28.1 | 261 | 7266 |
| CP72-356 | 2.18 | 23116 | 25.1 | 269 | 6761 |
| CP72-370 | 1.96 | 30761 | 30.0 | 254 | 7621 |
| CP74-383 | 1.91 | 37892 | 36.2 | 234 | 8474 |
| CP76-331 | 2.15 | 25404 | 27.3 | 263 | 7168 |
| CP79-318 | 1.83 | 28823 | 25.9 | 256 | 6623 |
| CP79-332 | 1.88 | 23882 | 22.2 | 273 | 6068 |
| CP80-323 | 2.04 | 26948 | 27.4 | 257 | 7043 |
| CP80-356 | 2.67 | 23196 | 30.8 | 258 | 7946 |
| LCP81-010 | 2.40 | 28913 | 34.5 | 216 | 7447 |
| LCP81-030 | 2.11 | 23799 | 25.0 | 269 | 6714 |
| CP81-332 | 2.12 | 20884 | 22.2 | 249 | 5515 |
| LSD | 0.32 | 7179 | 5.4 | 17 | 1224 |
| HSD | 0.58 | 12869 | 9.7 | 31 | 2194 |

Date Planted: 09/25/85 Soil Type: Light
Date Harvested: 11/21/86 Harvest Conditions: Poor

KT represents Kleentek seed source of this commercial variety brought to this location in 1983.

Table 10. The 1986 results for first stubble variety trial at Cinclare.

| VARIETY | MEAN STALK WEIGHT | STALKS PER ACRE | TONS PER ACRE | SUGAR PER TON | SUGAR PER ACRE |
|---|---|---|---|---|---|
| CP65-357 | 1.83 | 24545 | 22.3 | 267 | 5902 |
| CP65-357KT | 1.60 | 42635 | 33.9 | 261 | 8844 |
| CP70-321 | 2.02 | 26330 | 25.8 | 266 | 6810 |
| CP72-356 | 1.91 | 26920 | 25.8 | 276 | 7112 |
| CP72-370 | 1.81 | 34907 | 31.5 | 266 | 8386 |
| CP74-383 | 1.79 | 36217 | 32.5 | 243 | 7884 |
| CP76-331 | 2.03 | 25374 | 25.5 | 281 | 7174 |
| CP79-318 | 1.85 | 34614 | 31.7 | 261 | 8277 |
| CP79-332 | 1.68 | 29744 | 24.9 | 292 | 7296 |
| CP80-323 | 1.83 | 33934 | 31.0 | 275 | 8526 |
| CP80-356 | 2.24 | 22489 | 25.4 | 263 | 6669 |
| LSD | 0.24 | 9230 | NS | 20 | NS |
| HSD | 0.41 | 16025 | NS | 34 | NS |

Date Planted: 10/03/84 Soil Type: Light
Date Harvested: 11/21/86 Harvest Conditions: Poor

KT represents Kleentek seed source of this commercial variety brought to this location in 1983.

## ALLAIN

The plant cane, the first stubble and second stubble tests (Tables 11, 12, and 13) were harvested under ideal conditions. Harvesting conditions were dry, cane was erect, weed pressure was moderate with johnsongrass and bermudagrass present, and row conditions were normal. A one row harvester cut the cane in two directions and placed all the cane on the heap. Since these tests were cut early in the harvest season, they did not incur any wind or rain damage and all varieties were upright and harvested well.

Table 11. The 1986 results for plant cane variety trial at Allain.

| VARIETY | MEAN STALK WEIGHT | STALKS PER ACRE | TONS PER ACRE | SUGAR PER TON | SUGAR PER ACRE |
|---|---|---|---|---|---|
| CP65-357 | 2.20 | 19769 | 21.7 | 233 | 5043 |
| CP65-357KT | 1.98 | 25860 | 25.5 | 247 | 6271 |
| CP70-321 | 1.85 | 28582 | 26.4 | 239 | 6314 |
| CP72-356 | 2.27 | 19920 | 22.6 | 249 | 5612 |
| CP72-370 | 2.26 | 20525 | 23.3 | 249 | 5820 |
| CP74-383 | 2.09 | 29066 | 30.3 | 247 | 7506 |
| CP76-331 | 2.14 | 20657 | 22.1 | 260 | 5745 |
| CP79-318 | 2.52 | 20042 | 25.2 | 247 | 6230 |
| CP79-332 | 2.16 | 23445 | 25.2 | 250 | 6328 |
| CP80-323 | 2.16 | 21762 | 23.4 | 258 | 6032 |
| CP80-356 | 2.75 | 18181 | 25.1 | 246 | 6174 |
| LCP81-010 | 2.76 | 22807 | 31.3 | 217 | 6787 |
| LCP81-030 | 2.37 | 23543 | 27.9 | 259 | 7233 |
| CP81-332 | 1.93 | 24612 | 23.8 | 225 | 5349 |
| LSD | 0.21 | 4085 | 3.8 | 14 | 1026 |
| HSD | 0.38 | 7323 | 6.7 | 26 | 1839 |

Date Planted: 11/13/85 Soil Type: Heavy
Date Harvested: 11/03/86 Harvest Conditions: Good

KT represents Kleentek seed source of this commercial variety brought to this location in 1983.

Table 12. The 1986 results for first stubble variety trial at Allain.

| VARIETY | MEAN STALK WEIGHT | STALKS PER ACRE | TONS PER ACRE | SUGAR PER TON | SUGAR PER ACRE |
|---|---|---|---|---|---|
| CP65-357 | 2.13 | 23891 | 26.0 | 240 | 6231 |
| CP65-357KT | 1.88 | 29863 | 31.1 | 226 | 7004 |
| CP70-321 | 2.41 | 26798 | 32.7 | 245 | 8015 |
| CP72-356 | 2.04 | 33080 | 33.1 | 251 | 8298 |
| CP72-370 | 2.12 | 28629 | 29.0 | 247 | 7162 |
| CP74-383 | 2.48 | 24897 | 30.5 | 232 | 7086 |
| CP76-331 | 2.25 | 25251 | 28.2 | 238 | 6715 |
| CP79-318 | 1.84 | 36729 | 33.0 | 237 | 7815 |
| CP79-332 | 1.79 | 38380 | 34.4 | 244 | 8365 |
| CP80-323 | 2.22 | 30388 | 32.9 | 257 | 8459 |
| CP80-356 | 2.49 | 27797 | 34.3 | 240 | 8252 |
| LSD | NS | NS | 3.1 | NS | 778 |
| HSD | NS | NS | 5.3 | NS | 1346 |

Date Planted: 10/05/84 Soil Type: Heavy
Date Harvested: 11/03/86 Harvest Conditions: Good

KT represents Kleentek seed source of this commercial variety brought to this location in 1983.

Table 13. The 1986 results for second stubble variety trial at Allain.

| VARIETY | MEAN STALK WEIGHT | STALKS PER ACRE | TONS PER ACRE | SUGAR PER TON | SUGAR PER ACRE |
|---|---|---|---|---|---|
| CP65-357 | 1.90 | 20893 | 19.8 | 242 | 4798 |
| CP70-321 | 1.87 | 29064 | 27.2 | 241 | 6536 |
| CP72-356 | 2.09 | 32250 | 33.7 | 254 | 8569 |
| CP72-370 | 1.57 | 29604 | 23.2 | 249 | 5812 |
| CP74-383 | 1.94 | 34255 | 33.2 | 238 | 7892 |
| CP76-331 | 1.70 | 29597 | 25.0 | 263 | 6578 |
| CP79-318 | 1.79 | 28896 | 26.0 | 255 | 6635 |
| CP79-332 | 1.66 | 36617 | 30.2 | 260 | 7860 |
| LSD | 0.27 | 6007 | 5.6 | 12 | 1577 |
| HSD | 0.45 | 9883 | 9.3 | 20 | 2594 |

Date Planted: 10/05/85 Soil Type: Heavy
Date Harvested: 11/03/86 Harvest Conditions: Good

## PEARCE

The plant cane test (Table 14) was cut under wet field conditions. Due to excessive rain in June in this area, the field was not layed-by and the rows had a low profile. Johnsongrass and itchgrass were present but were primarily in the alleys. All varieties were severely lodged. Due to the careful operation of a one row harvester in one direction, all varieties harvested well. There was no visible damage to the stubble although it was cut higher than usual with intentions of raising the row profile to its normal level.

Table 14. The 1986 results for plant cane variety trial at F. Pearce.

| VARIETY | MEAN STALK WEIGHT | STALKS PER ACRE | TONS PER ACRE | SUGAR PER TON | SUGAR PER ACRE |
|---|---|---|---|---|---|
| CP65-357 | 2.17 | 32138 | 34.8 | 273 | 9480 |
| CP70-321 | 2.06 | 27790 | 28.7 | 254 | 7217 |
| CP72-356** | 2.43 | 21584 | 26.3 | 270 | 7095 |
| CP72-370 | 2.03 | 31399 | 31.5 | 270 | 8521 |
| CP74-383 | 2.16 | 33374 | 36.1 | 258 | 9304 |
| CP76-331 | 2.26 | 27789 | 31.0 | 272 | 8445 |
| CP79-318 | 1.88 | 35201 | 32.8 | 263 | 8628 |
| CP79-332 | 2.05 | 23270 | 23.7 | 275 | 6501 |
| CP80-323 | 1.93 | 32495 | 31.3 | 238 | 7435 |
| CP80-356 | 2.44 | 26856 | 32.9 | 233 | 7663 |
| LCP81-010 | 2.66 | 26448 | 35.3 | 227 | 8067 |
| LCP81-030 | 2.19 | 30365 | 32.9 | 268 | 8812 |
| CP81-332 | 1.91 | 34166 | 32.6 | 221 | 7229 |
| LSD | 0.38 | 6810 | 6.5 | 28 | NS |
| HSD | 0.67 | 12107 | 11.5 | 50 | NS |

Date Planted: 11/21/86 Soil Type: Light
Date Harvested: 12/01/86 Harvest Conditions: Poor

** Only two replications used in the analysis.

The first stubble test (Table 15) was cut under wet soil conditions. Due to excessive rain in June in this area of the belt the field was not layed-by and the rows had a low profile. The generally poor stand was probably due to the harvesting conditions of 1985 which were wet and resulted in uprooted stools. With the cooperation of management, itchgrass was allowed to develop to compare cane varieties under high weed pressure. The field was cut in one direction with a one row harvester.

Table 15. The 1986 results for first stubble variety trial at F. Pearce.

| VARIETY | MEAN STALK WEIGHT | STALKS PER ACRE | TONS PER ACRE | SUGAR PER TON | SUGAR PER ACRE |
|---|---|---|---|---|---|
| CP65-357 | 1.78 | 21973 | 19.6 | 288 | 5638 |
| CP70-321 | 1.63 | 23649 | 19.9 | 269 | 5465 |
| CP72-356 | 1.63 | 24899 | 21.7 | 280 | 6279 |
| CP74-383 | 1.72 | 24339 | 21.1 | 270 | 5721 |
| CP76-331 | 1.85 | 29675 | 26.9 | 297 | 8001 |
| CP79-318 | 1.97 | 22302 | 21.6 | 292 | 6337 |
| CP79-332 | 1.55 | 26164 | 21.2 | 309 | 6529 |
| CP80-323 | 1.67 | 36669 | 30.5 | 294 | 8960 |
| CP80-356 | 1.87 | 13123 | 12.9 | 271 | 3530 |
| LSD | NS | 11725 | NS | 18 | NS |
| HSD | NS | 19676 | NS | 30 | NS |

Date Planted: 09/26/84 Soil Type: Light
Date Harvested: 12/01/86 Harvest Conditions: Poor

PROJ. NUM.: 8614 UNITS: LBai/A
FILE NAME: PROJ8614 PRINTED: 11/12/86

L O U I S I A N A S T A T E U N I V E R S I T Y

ASULOX SURFACTANT TEST--JOHNSONGRASS

RESEARCH BY: LYNN M. KITCHEN COUNTY: ST. MARTIN ST: LA COUNTRY: USA
COOPERATOR : RHONE POULENC LAST UPDATE: 11/12/86 INITIATED: / /
TOTAL REPS : 4 EXPT. STATUS: COMPLETED: / /
REPORTED BY: LYNN KITCHEN RELATED FILE: SOURCE:

PREVIOUS CROP: SUGARCANE PLOT SIZE(LxW): 18.0x 30.0 SOIL pH : .
PREVIOUS TILL: CHOPPED SOIL TEXTURE: SOIL OM%: .
FERTILITY: ROW WIDTH: 072 EXPERIMENTAL DESIGN: RCB
MISC. 1: NUMBER OF REPS: 4
MISC. 2: REPORT TYPE:

PLANTING DATE: 09/01/83 CROP CULTIVAR: 65-357,70-331,72-383

| APPLICATION INFO | APPLIC. 1 | APPLIC. 2 | APPLIC. 3 | APPLIC. 4 | APPLIC. 5 |
|---|---|---|---|---|---|
| APPLICATION DATE | 05/07/86 | / / | / / | / / | / / |
| JULIAN DATE/YEAR | J127/86 | J 0/00 | J 0/00 | J 0/00 | J 0/00 |
| GEN. APPLIC TYPE | POE | | | | |
| AIR/SOIL TEMP(F) | 087/095 | / | / | / | / |
| % REL. HUMIDITY | 064% | | | | |
| WIND DIR/VELOC. | SO/10 | / | / | / | / |
| ROOT/LEAF MOIST. | DRY/DRY | / | / | / | / |
| INCORP. EQUIP. | N/A | | | | |
| INCORP. DEPTH in | . | . | . | . | . |
| SPRAYER TYPE | BACKPACK | | | | |
| SPRAYER GPA/PSI | 020.0/030 | . / | . / | . / | . / |
| NOZZLE TYPE | LF2 | | | | |

| SPEC. CODE | SPECIES | DEN-SITY | APPLIC. 1 HTin/STG. | APPLIC. 2 HTin/STG. | APPLIC. 3 HTin/STG. | APPLIC. 4 HTin/STG. | APPLIC. 5 HTin/STG. |
|---|---|---|---|---|---|---|---|
| ***** | **** CROP ***** | **** | ********* | ********* | ********* | ********* | ********* |
| SACOF | SUGARCANE | | 015/6L | / | / | / | / |
| ***** | **** PEST ***** | **** | ********* | ********* | ********* | ********* | ********* |
| SORHA | JOHNSONGRASS | | 024/BOOT | / | / | / | / |

SOIL MOISTURE ON 5/7/86:

| | |
|---|---|
| 0-3 IN | 11.9% |
| 3-6 IN | 16.2% |
| 6-12 IN | 21.1% |

| TRT. NO. | PESTICIDE NAME | FORMU. | LBai/A | APPLICATION TYPE | INJURY PERCENT J156/86 | SORHA CONTROL J156/86 |
|---|---|---|---|---|---|---|
| 01 | CHECK | | | | 0 | 5 |
| 02 | ASULOX | SC | 3.34 | POE | 3 | 43 |
| 03 | ASULOX | SC | 3.34 | POE | 8 | 60 |
| | X-77 | %A | 0.00 | POE | | |
| 04 | ASULOX | SC | 3.34 | POE | 13 | 58 |
| | X-77 | %A | 0.00 | POE | | |
| 05 | ASULOX | SC | 3.34 | POE | 0 | 50 |
| | AGRIDEX | %A | 0.00 | POE | | |
| 06 | ASULOX | SC | 3.34 | POE | 8 | 43 |
| | AGRIDEX | %A | 0.00 | POE | | |
| 07 | ASULOX | SC | 3.34 | POE | 5 | 45 |
| | PRIMOIL | %A | 0.00 | POE | | |
| 08 | ASULOX | SC | 3.34 | POE | 8 | 55 |
| | AG-98 | %A | 0.00 | POE | | |
| 09 | ASULOX | SC | 3.34 | POE | 8 | 55 |
| | AG-98 | %A | 0.00 | POE | | |
| 10 | ASULOX | SC | 3.34 | POE | 3 | 50 |
| | TD-2182 | %A | 0.00 | POE | | |
| 11 | ASULOX | SC | 3.34 | POE | 3 | 63 |
| | TD-2183 | %A | 0.00 | POE | | |
| 12 | ASULOX | SC | 3.34 | POE | 0 | 60 |
| | SURF WK | %A | 0.00 | POE | | |
| 13 | ASULOX | SC | 3.34 | POE | 10 | 50 |
| | ACTIV + | %A | 0.00 | POE | | |
| 14 | ASULOX | SC | 3.34 | POE | 3 | 43 |
| | ACCELER | %A | 0.00 | POE | | |
| 15 | ASULOX | SC | 3.34 | POE | 10 | 60 |
| | TWEEN-20 | %A | 0.00 | POE | | |
| | | | | LSD(0.05) = | 9 | 14 |
| | | | | STANDARD DEVIATION = | 6 | 9 |
| | | | | COEFF. OF VARIABILITY = | 116 | 22 |

## PROJECT SUMMARY

Johnsongrass control was enhanced by the addition of 0.25% and 0.5% X-77, 0.5% TD-2183, 0.5% Surfactant WK, and 0.5% Tween-20. Surfactants showing little or no enhancement of Asulox activity included 1% Agridex, 1% Prime Oil, and 1% Accelerate. It appears from this study that the oil concentrates did not perform as well as the non-ionic surfactants. Injury due to surfactant addition did not exeed 13%, thus all surfactants were considered safe for use with Asulox.

PROJ. NUM.: 8615 UNITS: LBai/A
FILE NAME: PROJ8615 PRINTED: 11/13/86

L O U I S I A N A S T A T E U N I V E R S I T Y

## ASULOX APPLICATION TECHNIQUE TEST

RESEARCH BY: LYNN M. KITCHEN COUNTY: ST. MARTIN ST: LA COUNTRY: USA
COOPERATOR : RHONE POULENC LAST UPDATE: 11/13/86 INITIATED: / /
TOTAL REPS : 4 EXPT. STATUS: COMPLETED: / /
REPORTED BY: LYNN KITCHEN RELATED FILE: SOURCE:

PREVIOUS CROP: SUGARCANE PLOT SIZE(LxW): 18.0x 30.0 SOIL pH : .
PREVIOUS TILL: OFF-BARRED, CHOPPED SOIL TEXTURE: SI LO SOIL OM%: .
FERTILITY: ROW WIDTH: 072 EXPERIMENTAL DESIGN: RCB
MISC. 1: NUMBER OF REPS: 4
MISC. 2: REPORT TYPE:

PLANTING DATE: 09/01/83 CROP CULTIVAR: CP 70-331 & CP 65-357

| APPLICATION INFO | APPLIC. 1 | APPLIC. 2 | APPLIC. 3 | APPLIC. 4 | APPLIC. 5 |
|---|---|---|---|---|---|
| APPLICATION DATE | 05/08/86 | / / | / / | / / | / / |
| JULIAN DATE/YEAR | J128/86 | J 0/00 | J 0/00 | J 0/00 | J 0/00 |
| GEN. APPLIC TYPE | ALL | | | | |
| AIR/SOIL TEMP(F) | 082/081 | / | / | / | / |
| % REL. HUMIDITY | 074% | | | | |
| WIND DIR/VELOC. | SO/07 | / | / | / | / |
| ROOT/LEAF MOIST. | DRY/DRY | / | / | / | / |
| INCORP. EQUIP. | N/A | | | | |
| INCORP. DEPTH in | N/A | . | . | . | . |
| SPRAYER TYPE | BACKPACK | | | | |
| SPRAYER GPA/PSI | 020.0/030 | 020.0/050 | . / | . / | 018.4/ |
| NOZZLE TYPE | FLAT FAN | HOLLOW CONE | | | |

| SPEC. CODE | SPECIES | DEN-SITY | APPLIC. 1 HTin/STG. | APPLIC. 2 HTin/STG. | APPLIC. 3 HTin/STG. | APPLIC. 4 HTin/STG. | APPLIC. 5 HTin/STG. |
|---|---|---|---|---|---|---|---|
| ***** | **** CROP ***** | **** | ********* | ********* | ********* | ********* | ********* |
| SACOF | SUGARCANE | | 012/4L | / | / | / | / |
| ***** | **** PEST ***** | **** | ********* | ********* | ********* | ********* | ********* |
| SORHA | JOHNSONGRASS | | 030/BOOT | / | / | / | / |

EXPERIMENT COMMENTS

BRD = BROADCAST APPLICATION;
2FFD = 2 FLAT FAN NOZZLES POINTED DOWN;
2FFU = 2 FLAT FAN NOZZLES POINTED UP;
3FF = 3 FLAT FAN NOZZLES;
3C = 3 HOLLOW CONE NOZZLES;
1EFF = 1 EVEN FLAT FAN NOZZLE OVERTOP.

SOIL MOISTURE LEVELS:
(5/8/86):

| | |
|---|---|
| 0-3 | 9.0% |
| 3-6 | 16.8% |
| 6-12 | 15.9% |

| TRT. NO. | PESTICIDE NAME | FORMU. | LBai/A | APPLI-CATION TYPE | INJURY PERCENT J156/86 | SORHA CONTROL J156/86 |
|---|---|---|---|---|---|---|
| 01 | CHECK | | | | 0 | 0 |
| 02 | ASULOX | SC | 3.34 2.000 | BRD | 0 | 43 |
| 03 | ASULOX | SC | 3.34 2.000 | 2FFD | 0 | 58 |
| 04 | ASULOX | SC | 3.34 2.000 | 2FFU | 0 | 47 |
| 05 | ASULOX | SC | 3.34 2.000 | 3FF | 0 | 38 |
| 06 | ASULOX | SC | 3.34 2.000 | 3C | 0 | 28 |
| 07 | ASULOX | SC | 3.34 2.000 | 1EFF | 0 | 35 |
| 08 | ASULOX | SC | 3.34 3.000 | POEBR | 0 | 48 |
| 09 | ASULOX | SC | 3.34 3.000 | 2FFD | 0 | 45 |
| 10 | ASULOX | SC | 3.34 3.000 | 2FFU | 0 | 48 |
| 11 | ASULOX | SC | 3.34 3.000 | 3FF | 0 | 60 |
| 12 | ASULOX | SC | 3.34 3.000 | 3C | 0 | 55 |
| 13 | ASULOX | SC | 3.34 3.000 | 1EFF | 0 | 43 |
| | | | | LSD(0.05) = | NA | 16 |
| | | | | STANDARD DEVIATION = | NA | 11 |
| | | | | COEFF. OF VARIABILITY = | NA | 28 |

## PROJECT SUMMARY

Nozzle arrangement appears to have a strong influence on the activity of Asulox in sugarcane. When Asulox was applied at 2 lb/A, the best nozzle arrangement was 2 flat fan nozzles directed downward and the least effective arrangement was three hollow cone nozzles. Increasing the rate of application resulted in the 3 flat fan nozzle arrangement providing superior control of johnsongrass. In general, the most consistent weed control was provided by some arrangement of flat fan nozzles. This research will be continued in 1987 with dyes to determine the coverage and efficacy involved with each nozzle type and arrangement.

PROJ. NUM.: 8617 UNITS: LBai/A
FILE NAME: PROJ8617 PRINTED: 02/02/87

L O U I S I A N A S T A T E U N I V E R S I T Y

SUGARCANE TOLERANCE TEST

RESEARCH BY: LYNN KITCHEN COUNTY: IBERVILLE ST: LA COUNTRY: USA
COOPERATOR : SEVERAL LAST UPDATE: 1/01/80 INITIATED: / /
TOTAL REPS : 4 EXPT. STATUS: COMPLETED: / /
REPORTED BY: LYNN M. KITCHEN RELATED FILE: SOURCE:

PREVIOUS CROP: FALLOW PLOT SIZE(LxW): 18.0x 30.0 SOIL pH :6.0
PREVIOUS TILL: OFF-BAR, CHOPPED SOIL TEXTURE: SI LO SOIL OM%: 00.8
FERTILITY: 80 LB/A N ROW WIDTH: 070 EXPERIMENTAL DESIGN: RCB
MISC. 1: ST. GABRIEL RESEARCH STATION NUMBER OF REPS: 4
MISC. 2: REPORT TYPE:

PLANTING DATE: 09/25/85 CROP CULTIVAR: CP 65-357

| APPLICATION INFO | APPLIC. 1 | APPLIC. 2 | APPLIC. 3 | APPLIC. 4 | APPLIC. 5 |
|---|---|---|---|---|---|
| APPLICATION DATE | 05/22/86 | / / | / / | / / | / / |
| JULIAN DATE/YEAR | J142/86 | J 0/00 | J 0/00 | J 0/00 | J 0/00 |
| GEN. APPLIC TYPE | POE | | | | |
| AIR/SOIL TEMP(F) | 078/070 | / | / | / | / |
| % REL. HUMIDITY | 680% | | | | |
| WIND DIR/VELOC. | SE/04 | / | / | / | / |
| ROOT/LEAF MOIST. | MOI/DRY | / | / | / | / |
| INCORP. EQUIP. | N/A | | | | |
| INCORP. DEPTH in | . | . | . | . | . |
| SPRAYER TYPE | TRACTOR | | | | |
| SPRAYER GPA/PSI | 020.0/030 | . / | . / | . / | . / |
| NOZZLE TYPE | LF2 | | | | |
| RAIN / IRRIG. in | | | | | |
| 0-24 hr/1-3 days | 0.00/0.13 | . / . | . / . | . / . | . / . |
| 4-7 days/2nd wk | 1.90/0.50 | . / . | . / . | . / . | . / . |
| 3rd / 4th week | 1.79/0.25 | . / . | . / . | . / . | . / . |

| SPEC. CODE | SPECIES | DEN-SITY | APPLIC. 1 HTin/STG. | APPLIC. 2 HTin/STG. | APPLIC. 3 HTin/STG. | APPLIC. 4 HTin/STG. | APPLIC. 5 HTin/STG. |
|---|---|---|---|---|---|---|---|
| ***** | **** CROP ***** | **** | ********* | ********* | ********* | ********* | ********* |
| SACOF | SUGARCANE | | 030/6C | / | / | / | / |

SOIL MOISTURE LEVEL ON 5-22-86:
0-3 IN 7.7%
3-6 IN 6.6%
6-12 IN ----

SUGARCANE: 36 IN. AT THE TIME OF THE FIRST EVALUATION.

INJURY NOTES:

TREATMENTS 2 AND 3 APPEARED TO JUST STUNT CANE; TRT. 4 STUNTED CANE WITH SOME CHLOROSIS, AS DID TRT. 5; TRT. 7 CAUSED CHLOROSIS; TRT. 10 CAUSED REDDENING OF LEAVES AND REDUCTION IN GROWTH; TRT. 20 BLEACHED THE LEAVES, HAD NO EFFECT ON GROWTH; TRT. 19 NEARLY KILLED CANE WITH STRONG NECROSIS. TRT. 18 HAD LOCALIZED CHLOROSIS AND WAS COMING OUT OF IT; TRT. 17 MINOR CHLOROSIS; TRT. 15 HAD GENERAL CHLOROSIS THAT APPEARED TO CONTINUE AFTER THE PLANT WAS TREATED; TRT. 13 SHOWED SLIGHT GROWTH INHIBITION; TRT. 12 SHOWED COMPLETE INHIBITION OF GROWTH AND REDDENING OF LEAVES; TRT. 11 SHOWED GROWTH INHIBITION; TRT. 27 HAD MINOR CHLOROSIS LOCALIZED TO SITES OF APPLICATION. ALL OTHER TREATMENTS RESULTED IN NO OBVIOUS INJURY SYMPTOMS.

L O U I S I A N A S T A T E U N I V E R S I T Y

SUGARCANE TOLERANCE TEST

| TRT. | PESTICIDE | | | APPLI-CATION | INJURY PERCENT | POPULAT PL/ACRE | MSTWT LBS | TCA TONS/A | SUCROSE PERCENT | CSUGAR LBS/A |
|---|---|---|---|---|---|---|---|---|---|---|
| NO. | NAME | FORMU. | LBai/A | TYPE | J161/86 | J244/86 | J325/86 | J324/86 | J325/86 | J325/86 |
| 01 | CHECK | | | | 0 | 32761 | 2.82 | 46 | 16.25 | 8528 |
| 02 | REFLEX | SC | 2.00 0.500 | POE | 10 | 36572 | 2.65 | 48 | 16.30 | 8894 |
| 03 | COBRA | EC | 2.00 0.200 | POE | 3 | 34031 | 2.70 | 46 | 15.95 | 8221 |
| 04 | CANOPY | WP | 75.0 0.500 | POE | 20 | 36391 | 2.20 | 40 | 14.90 | 6767 |
| 05 | CANOPY | WP | 75.0 1.000 | POE | 15 | 37026 | 2.23 | 41 | 15.23 | 7130 |
| 06 | CLASSIC | WP | 25.0 0.008 | POE | 0 | 36300 | 3.01 | 55 | 15.98 | 9793 |
| 07 | GEMINI | WP | 60.0 1.000 | POE | 8 | 33396 | 2.67 | 45 | 15.50 | 7919 |
| 08 | BAS-514 | WP | 50.0 0.150 | POE | 5 | 34122 | 2.72 | 47 | 16.05 | 8414 |
| 09 | SCEPTER | SC | 1.50 0.188 | POE | 30 | 32035 | 2.45 | 40 | 15.05 | 6589 |
| 10 | ARSENAL | SC | 2.00 0.100 | POE | 43 | 26045 | 2.29 | 30 | 15.48 | 5260 |
| 11 | PURSUIT | SC | 1.95 0.125 | POE | 33 | 29403 | 2.33 | 34 | 15.88 | 6099 |
| 12 | SCEP/PRO | EC | 2.40 2.400 | POE | 53 | 20328 | 1.88 | 19 | 12.93 | 2816 |
| 13 | CROSSBOW | EC | 3.00 3.000 | POE | 8 | 36209 | 2.46 | 45 | 15.78 | 7996 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 14 | CINCH | EC | 7.00 | 0.750 | POE | 10 | 34213 | 2.33 | 39 | 15.13 | 6785 |
| 15 | SC-0774 | WP | 75.0 | 1.000 | POE | 23 | 36209 | 2.35 | 42 | 13.88 | 6587 |
| 16 | SC-0051 | SC | 3.00 | 1.000 | POE | 0 | 33850 | 2.27 | 38 | 14.33 | 6140 |
| 17 | ZORIAL | WP | 80.0 | 1.000 | POE | 3 | 33850 | 2.86 | 48 | 14.63 | 7823 |
| 18 | RE-40885 | EC | 1.50 | 0.750 | POE | 20 | 33850 | 2.27 | 38 | 16.00 | 6875 |
| 19 | SELECT | EC | 2.00 | 0.250 | POE | 68 | 6597 | 1.99 | 11 | 13.33 | 1455 |
| 20 | COMMAND | EC | 6.00 | 1.000 | POE | 20 | 34122 | 2.61 | 45 | 15.80 | 8013 |
| 21 | TD-2211 | SC | 4.00 | 3.000 | POE | 0 | 34576 | 2.63 | 46 | 15.95 | 8244 |
| 22 | TD-2212 | WP | 16.6 | 3.000 | POE | 3 | 33941 | 2.42 | 40 | 15.13 | 6744 |
| 23 | DPXM6316 | WP | 75.0 | 0.016 | POE | 0 | 35665 | 2.36 | 43 | 15.63 | 7678 |
| 24 | RS-010 | WP | 45.0 | 0.900 | POE | 0 | 35756 | 2.58 | 46 | 16.40 | 8519 |
| | X-77 | %A | 0.00 | 0.500 | POE | | | | | | |
| 25 | RS-010 | WP | 45.0 | 0.900 | POE | 0 | 35030 | 2.62 | 46 | 16.18 | 8337 |
| | ASULOX | SC | 3.34 | 2.500 | POE | | | | | | |
| | X-77 | %A | 0.00 | 0.500 | POE | | | | | | |
| 26 | RS-010 | WP | 45.0 | 0.900 | POE | 0 | 36572 | 2.33 | 42 | 15.20 | 7269 |
| | ASULOX | SC | 3.34 | 3.000 | POE | | | | | | |
| | X-77 | %A | 0.00 | 0.500 | POE | | | | | | |
| 27 | RS-010 | WP | 45.0 | 0.900 | POE | 5 | 31853 | 2.65 | 42 | 14.83 | 7019 |
| | AATREX | WP | 90.0 | 2.000 | POE | | | | | | |
| | AGRIDEX | %A | 0.00 | 1.000 | POE | | | | | | |
| 28 | AATREX | WP | 90.0 | 2.000 | POE | 8 | 36482 | 2.18 | 42 | 14.70 | 7034 |
| | AGRIDEX | %A | 0.00 | 1.000 | POE | | | | | | |
| 29 | ASULOX | SC | 3.34 | 2.500 | POE | 0 | 32398 | 2.61 | 43 | 15.83 | 7497 |
| | X-77 | %A | 0.00 | 0.500 | POE | | | | | | |
| 30 | ASULOX | SC | 3.34 | 3.000 | POE | 3 | 34576 | 2.85 | 51 | 15.30 | 8709 |
| | X-77 | %A | 0.00 | 0.500 | POE | | | | | | |
| | | | | | LSD(0.05) = | 12 | 6302 | NA | 6 | .81 | 1833 |
| | | | | | STANDARD DEVIATION = | 8 | 4365 | NA | 4 | .56 | 1269 |
| | | | | | COEFF. OF VARIABILITY = | 65 | 13 | NA | 11 | 4.00 | 19 |

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